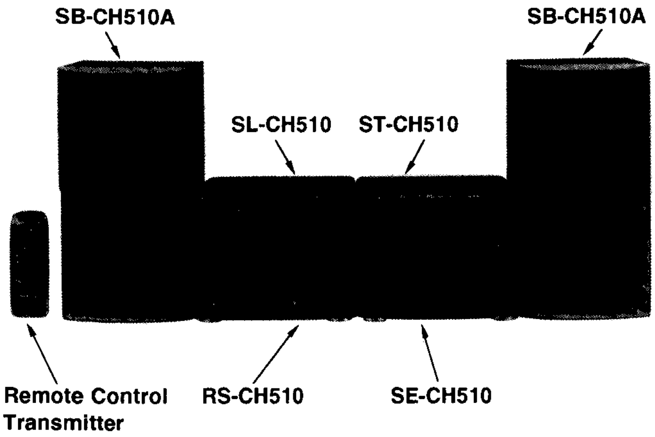
ORDER NO. AD9407197C8

# Service Manual

Amplifier

Amplifier

# SE-CH510



**Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.**

**Colour**

(K) ................ Black Type

**Areas**

| Suffix for Model No. | Area | Colour |
|---|---|---|
| (E) | Europe | (K) |
| (EB) | Great Britain | |
| (EG) | Germany and Italy | |
| (GC) | Asia, Latin America, Middle Near East and Africa | |
| (GN) | Oceania | |

**System: SC-CH510**

## Specifications

| | |
|---|---|
| **Power output** | |
| **DIN 1 kHz, THD 1%, both channel driven** | 2 × 35 W (6Ω) |
| **Total harmonic distortion** | |
| **Rated power at 1 kHz** | 1% (6Ω) |
| **Half power at 1 kHz** | 0.09% (6Ω) |
| **Load impedance** | |
| **MAIN** | 6Ω |
| **S/N (rated power)** | |
| **MAIN** | 84 dB |
| **Frequency response** | |
| **MAIN** | 40 Hz – 30 kHz |

### ■ General

| | |
|---|---|
| **Power consumption** | 128 W |
| **Power supply** | |
| **For (E) and (EG) areas** | 50 Hz/60 Hz AC, 230 V |
| **For (EB) and (GN) areas** | 50 Hz/60 Hz AC, 230 V – 240 V |
| **For (GC) area only** | 50 Hz/60 Hz AC, 110 V/127 V/220 V/240V |
| **Dimensions (W × H × D)** | 270 × 118.5 × 339.5 mm |
| **Weight** | |
| **For (E), (EB), (EG) and (GN) areas** | 4.2 kg |
| **For (GC) area only** | 4.4 kg |

**Notes:**
1. Specifications are subject to change without notice. Weight and dimensions are approximate.
2. Total harmonic distortion is measured by the digital spectrum analyzer.

| System | Tuner/sound processor | Compact disc player | Amplifier | Cassette Deck | Speakers |
|---|---|---|---|---|---|
| **SC-CH510** | ST-CH510 | SL-CH510 | **SE-CH510** | RS-CH510 | * SB-CH510A |

*: For (E), (EG), (EB) areas ........ Made in PAES
For (GC), (GN) areas ............. Made in NABEL

Technics®

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# ■ Before Repair

(1) Turn off the power supply. Using a 10 Ω, 10 W resistor, connect both ends of power supply capacitors (C701, C702) in order to discharge the voltage.

(2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50/60 Hz in NO SIGNAL mode should be shown below with respect to supply voltage 110 V/127 V/220 V/240 V.

| Power supply voltage | AC 230 V | AC 240 V | AC 110~127 V | AC 220~240 V |
|---|---|---|---|---|
| Consumed current 50Hz | 50~150 mA | 50~150 mA | 100~320 mA | 50~160 mA |

# ■ Protection Circuitry

The protection circuitry may have operated if either of the following conditions is noticed:

∗No sound is heard when the power is switched ON.

∗Sound stops during a performance.

The functions of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlined below:

1. Switch OFF the power.
2. Determine the cause of the problem and correct it.
3. Switch ON the power once again.

**Note:**

When the protection circuitry functions, the unit will not operate unless the power is first switched OFF and then ON again.

**For aras except (E) (EB) (EG) (GN)**

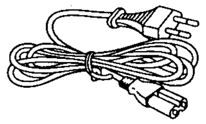
**CAUTION:**

**The AC voltage differs according to the area.**
**Be sure to set the proper voltage in your area befor use.**

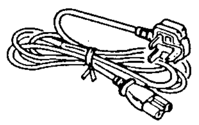
## ■ Accessories

- AC power supply cord ............ 1

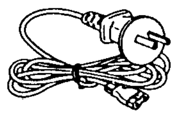
for (E), (EG) and (GC) areas : (RJA0019-2A)



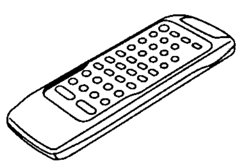
for (EB) area : (VJA0733)



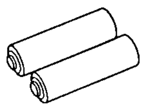
for (GN) area : (RJA0036-K)



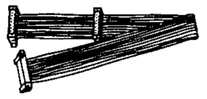
- Remote control transmitter
  (RAK-CH144WH) ............ 1



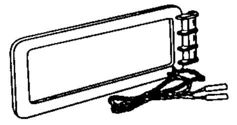
- Batteries
  (UM-4, "AAA", R03) ............ 2
  **Note:** These are available on sales route.



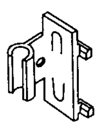
- Flat cable
  Long (REX0511) ............ 1
  Short (REX0608) ............ 1



- AM (LW/MW) loop antenna
  (RSA0012) ............ 1

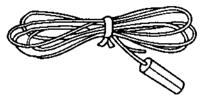


- Antenna holder
  (RMN0244) ............ 1

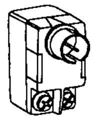


- Mounting screw
  (XTN3+12AFZ) ............ 1

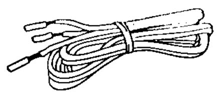
- FM indoor antenna
  (RSA0007) ............ 1

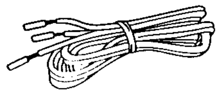


- Antenna plug
  (RFE0014) ............ 1
  for (GC) and (GN) areas

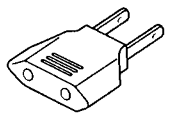


- Speaker cords
  (REE0499) ............ 2

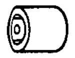




- Power plug adaptor
  (SJP5213-2) ............ 1
  for (GC) area only



- Attachment plug
  for (EB) area (SJP9009) ............ 1



**Note:**
The configurations of AC power supply cord and FM indoor antenna differ according to area.

## ■ Caution for AC Mains Lead

**("EB" area code model only)**

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ◈ or the BSI mark ♡ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local dealer.

**CAUTION!**
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

### IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

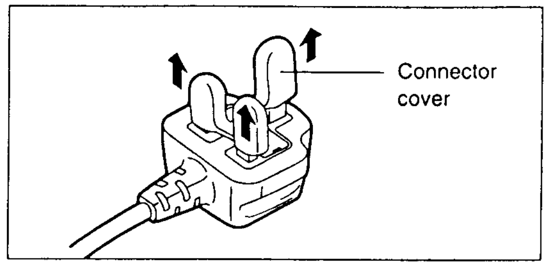
This apparatus was produced to BS 800.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚.

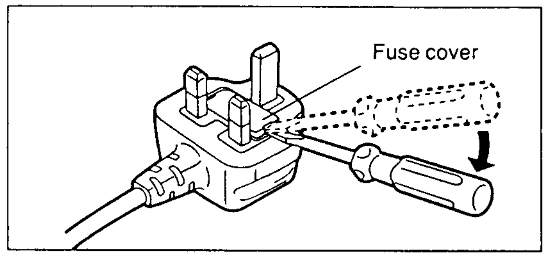
### Before use

Remove the connector cover as follows.

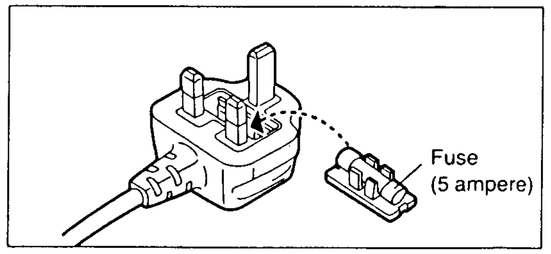


### How to replace the fuse

1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



## ■ Stacking the Components

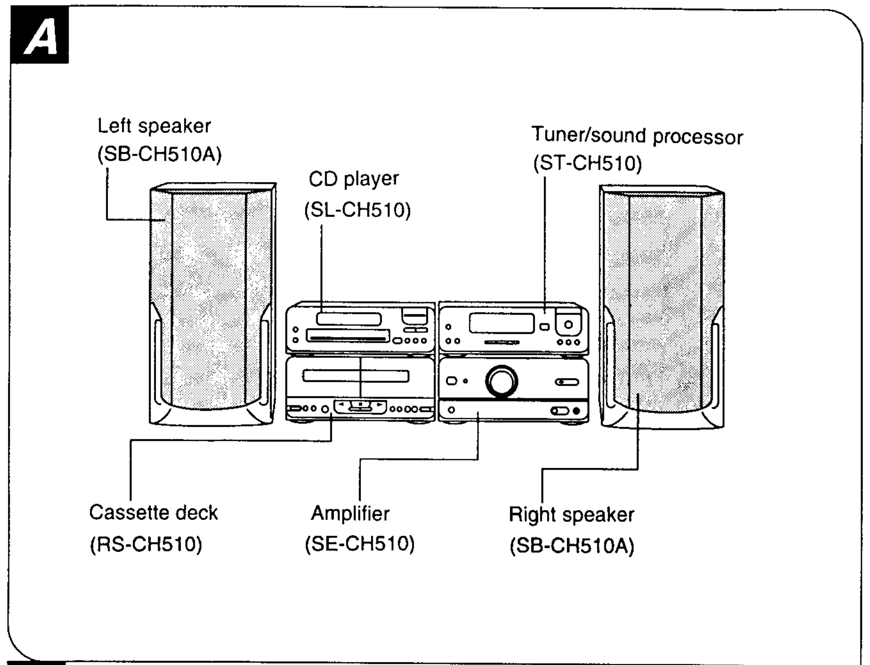
Install the various components as shown in the illustration.

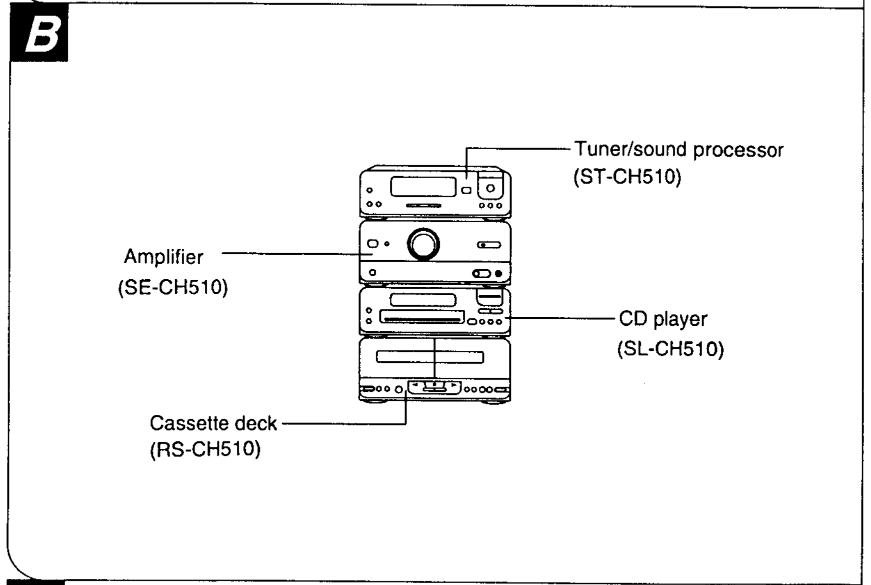
*Horizontal stacking* A

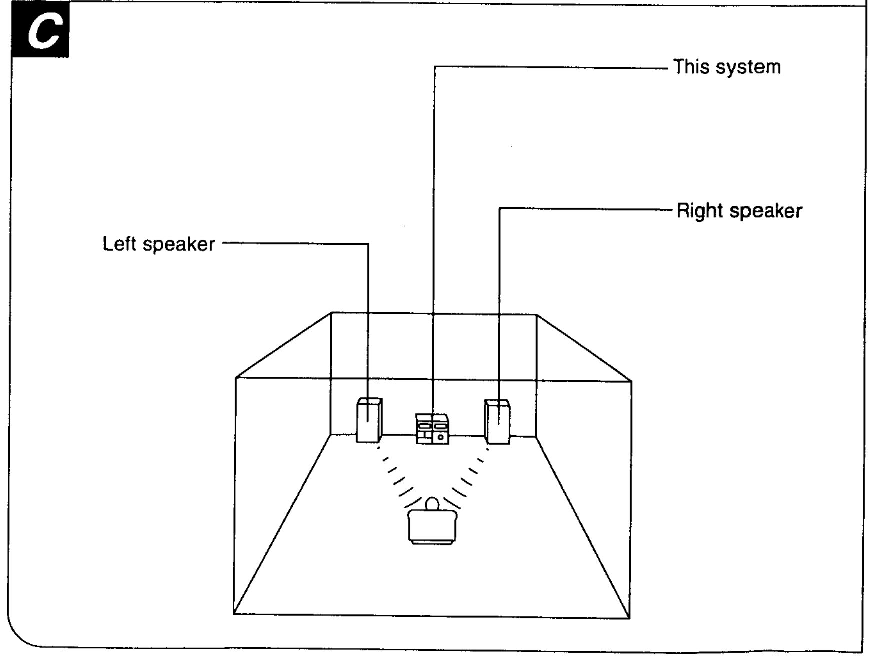
*Vertical stacking* B

*System layout example* C

To produce a better stereo sound, install both speakers away from the system.


A
Left speaker
(SB-CH510A)
CD player
(SL-CH510)
Tuner/sound processor
(ST-CH510)
Cassette deck
(RS-CH510)
Amplifier
(SE-CH510)
Right speaker
(SB-CH510A)


B
Tuner/sound processor
(ST-CH510)
Amplifier
(SE-CH510)
CD player
(SL-CH510)
Cassette deck
(RS-CH510)


C
This system
Right speaker
Left speaker

## ■ Connections

Connect the AC power supply cord after you have connected all other cables.

*1* **Connect the flat cables.**
Hold the connector with the recessed part up and press in at the center until you hear a click.

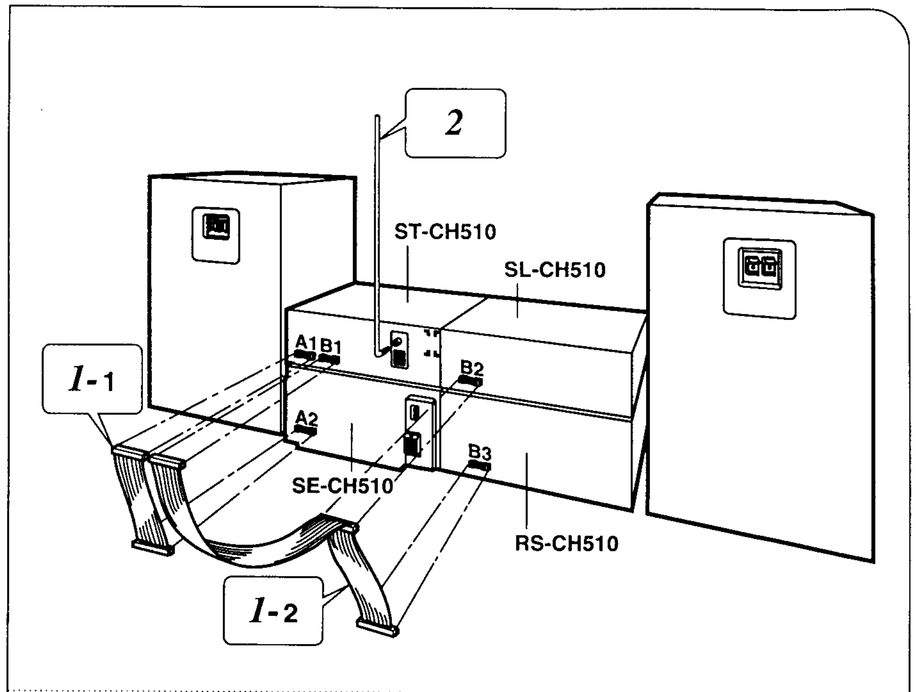
1. Connect the shorter flat cable to the terminal of the tuner/sound processor and amplifier.
2. Connect the longer flat cable to the terminal of the tuner/sound processor, compact disc player, and cassette deck.

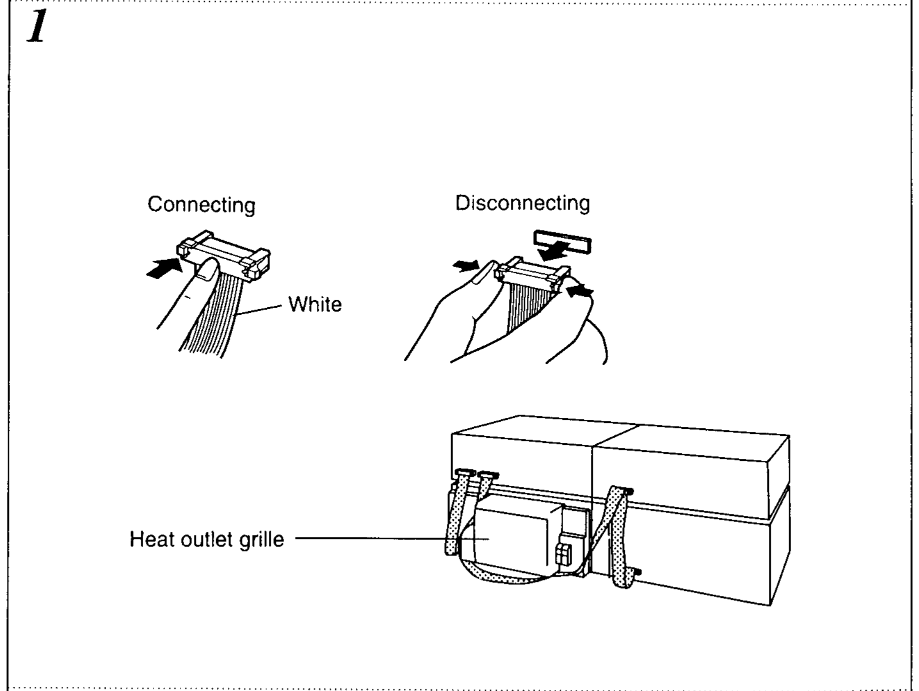
Be sure to connect the blue-colored connector to B1 (tuner/sound processor).
After connection, hold and press the cable as flat to the back of the unit as possible. (To minimize noise pickup while listening an AM broadcast)

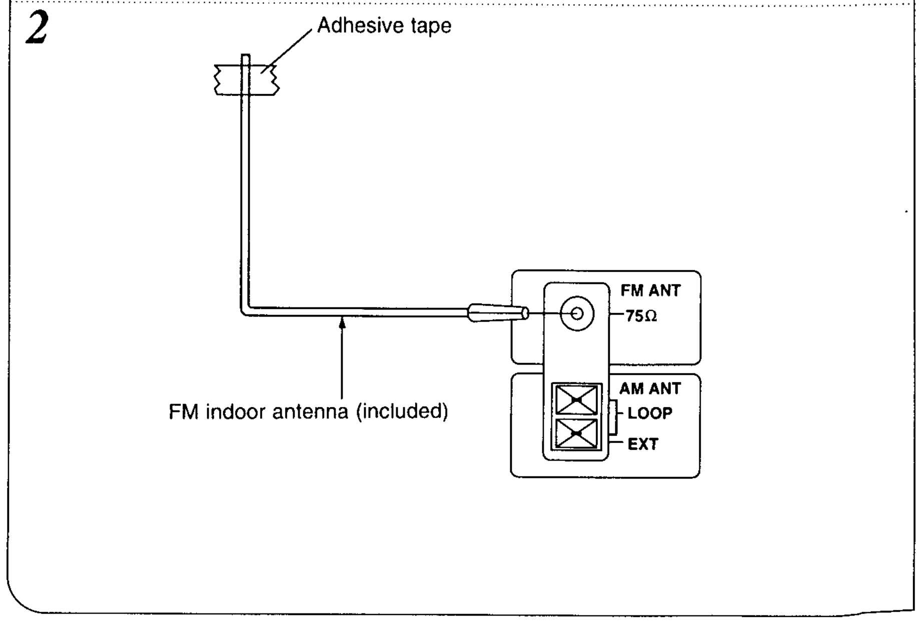
**Do not try connecting or disconnecting the flat cables while the power is switched to ON.**

*2* **Connect the FM indoor antenna.**
Install the antenna on a wall at a height and in a direction which result in the best reception.
The tip of the internal antenna wire should not come into contact with any metal objects.
When you cannot get a good reception with this FM indoor antenna, we recommend you install an FM outdoor antenna (not included).

**(To be continued)**


2
ST-CH510
SL-CH510
1-1
A1
B1
B2
A2
B3
SE-CH510
RS-CH510
1-2


1
Connecting
White
Disconnecting
Heat outlet grille


2
Adhesive tape
FM ANT
75Ω
AM ANT
LOOP
EXT
FM indoor antenna (included)

**(Continued)**

## 3 Connect the AM (MW/LW) loop antenna.

1. Attach the antenna holder to the rear panel of the tuner/sound processor. Press the antenna holder hard enough to get it fixed firmly in the place, with a click.
2. Clamp the antenna to the antenna holder.
3. Connect the antenna terminal to the rear panel of the tuner/sound processor.

① Strip off the outer covering.
② Twist the wire.
③ Insert the wire to the terminal of the tuner/sound processor.
④ Close the lever of the terminal.

(After you have connected all other cables)

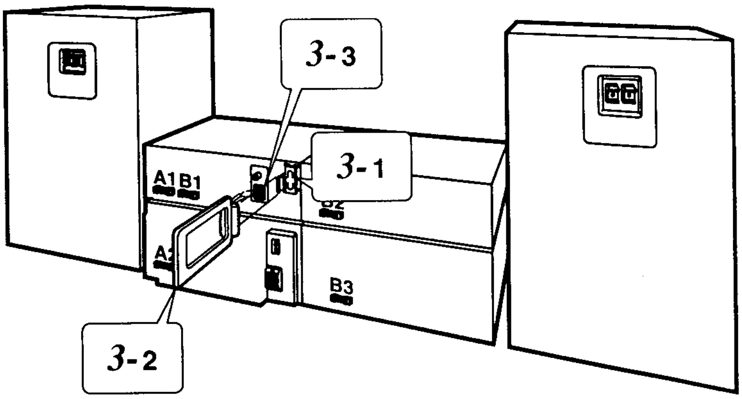
4. While listening to a MW/LW broadcast, position the loop antenna for the best reception.

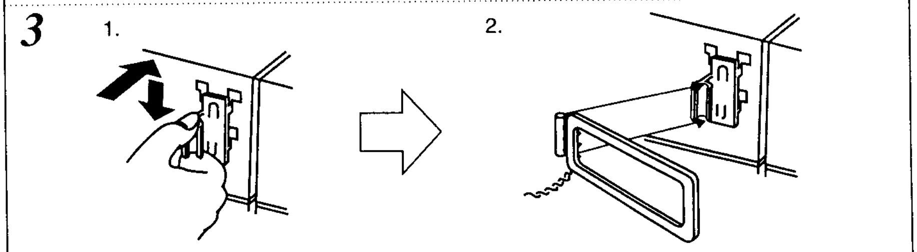
You may attach the antenna holder to a rack or other structure. Use a screw (included) to attach as showed in the figure. **A**

**Note**

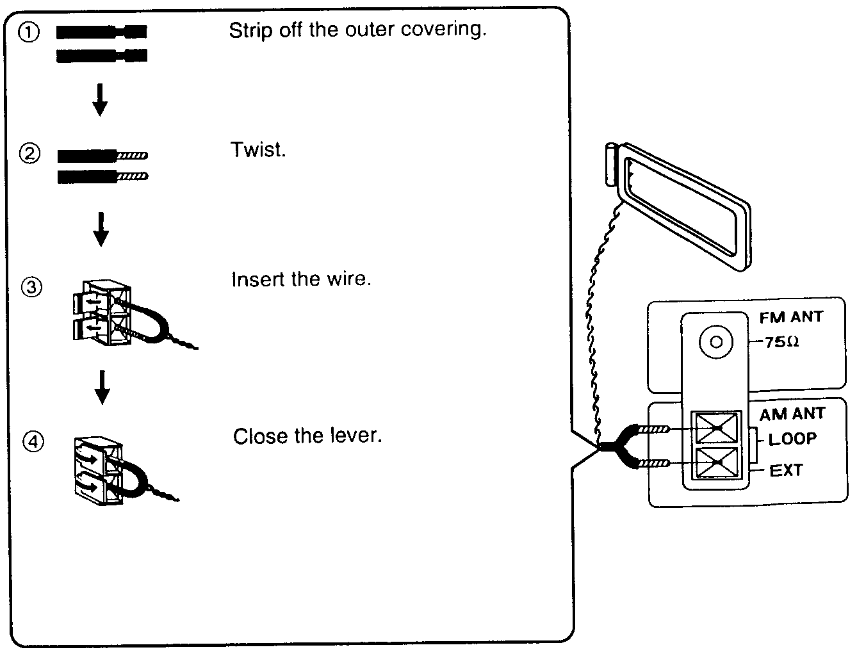
To minimize noise pickup, keep the AM loop antenna cord away from the flat cables.

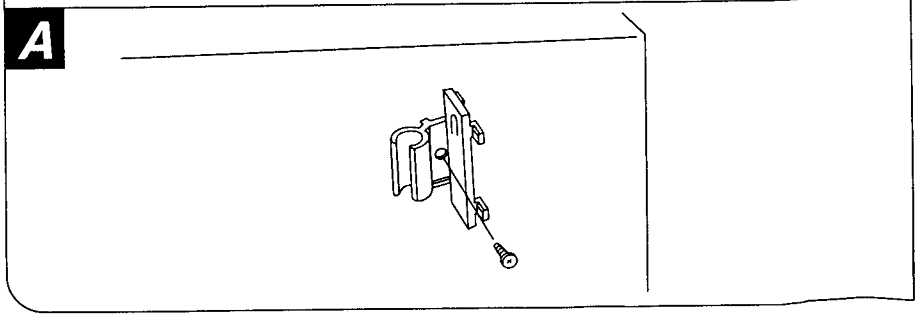
**(To be continued)**


3-3
3-1
3-2
A1
B1
A2
B2
B3



3.


①
Strip off the outer covering.
②
Twist.
③
Insert the wire.
④
Close the lever.
FM ANT
75Ω
AM ANT
LOOP
EXT



(Continued)

## *4* Connect the right (R) left (L) speaker cables.

**Note**

Be sure to connect speaker cables before connecting the AC power supply cord.

- The load impedance of any speaker used with this unit must be 6–8Ω.

**Connection of speaker cables A**

1. Strip off the outer covering, and twist the center conductor.
   Make sure the bare ends of the wires are not unraveled. (If they are, twist them tight again.)
2. ① Tilt the lever back and insert the wire.
   ② Close the lever and pull the cord gently to be sure that it is secured.
3. Insert the wire to the rear panel of the amplifier, and close the lever.

**Notes**

- To prevent damage to circuitry, never short-circuit positive (+) and negative (−) speaker wires.
- Be sure to connect only positive (+) wires to positive (+) terminals and negative (−) wires to negative (−) terminals.

## *5* Connect the AC power supply cord after you have connected all other cables and cords.

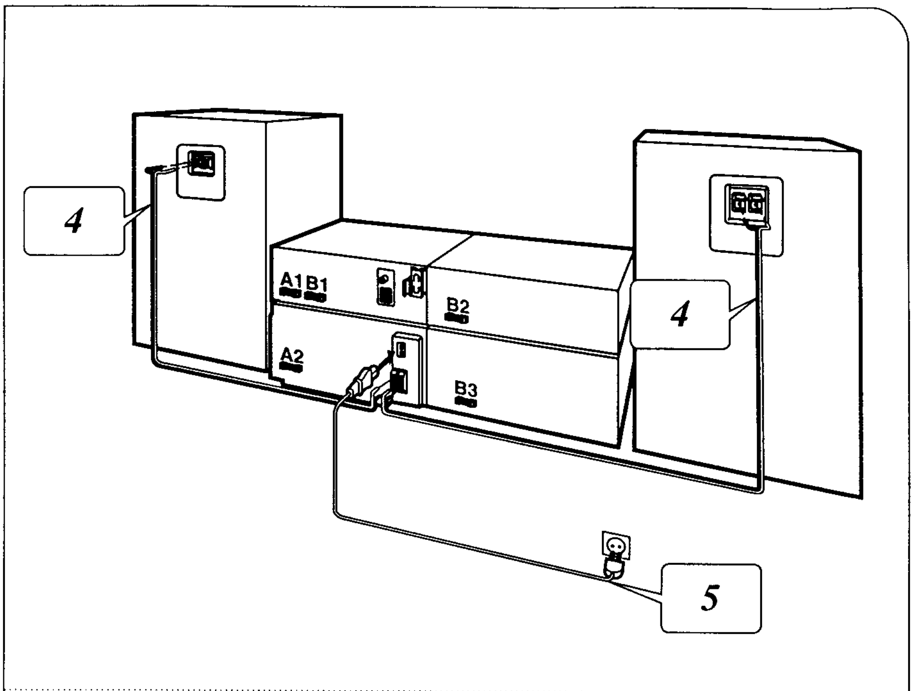
**Insertion of connector B**

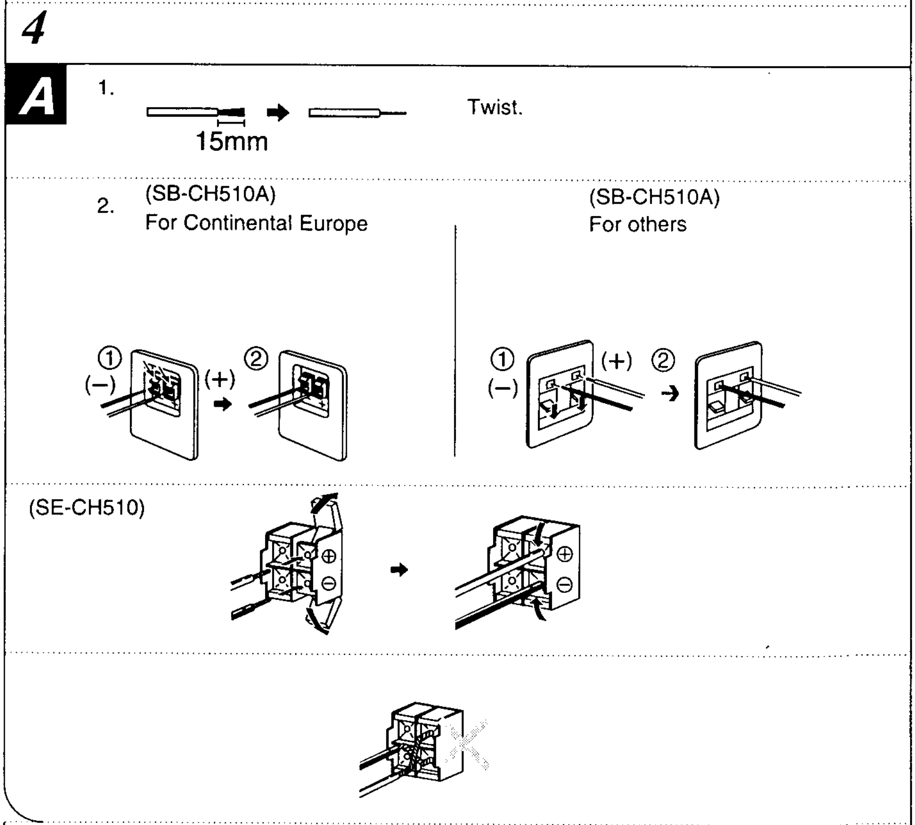
Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing. However there is no problem using the unit.

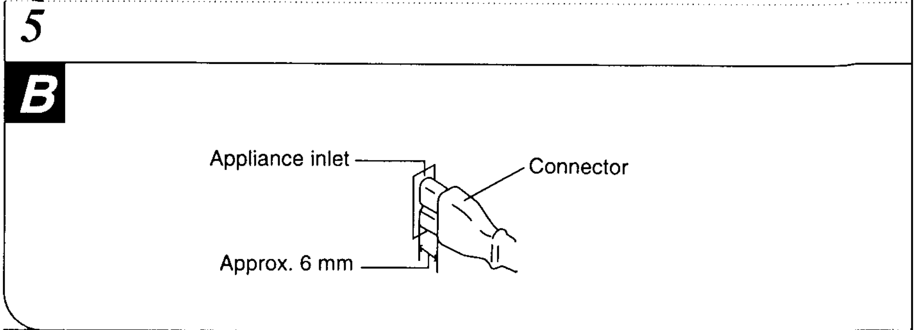
**For areas except for Continental Europe C**

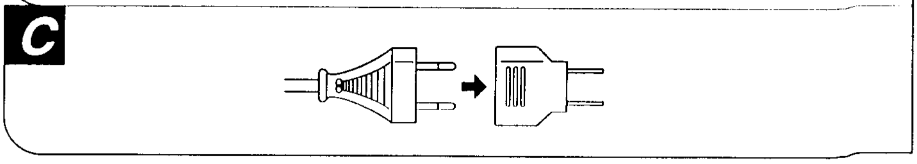
If the power plug will not fit your socket, use the power plug adaptor (included).

(To be continued)


4
A1 B1
A2
B2
B3
4
5


4
A
1.
15mm
Twist.
2.
(SB-CH510A)
For Continental Europe
①
(−)
(+)
②
(SB-CH510A)
For others
①
(−)
(+)
②
(SE-CH510)
⊕
⊖


5
B
Appliance inlet
Connector
Approx. 6 mm



**(Continued)**

## *Optional antenna connections*

### *FM outdoor antenna (not included)* A

You may need an outdoor antenna if you use this system in a mountainous region or inside a reinforced-concrete building, etc.
An outdoor antenna should be installed by a competent technician only.

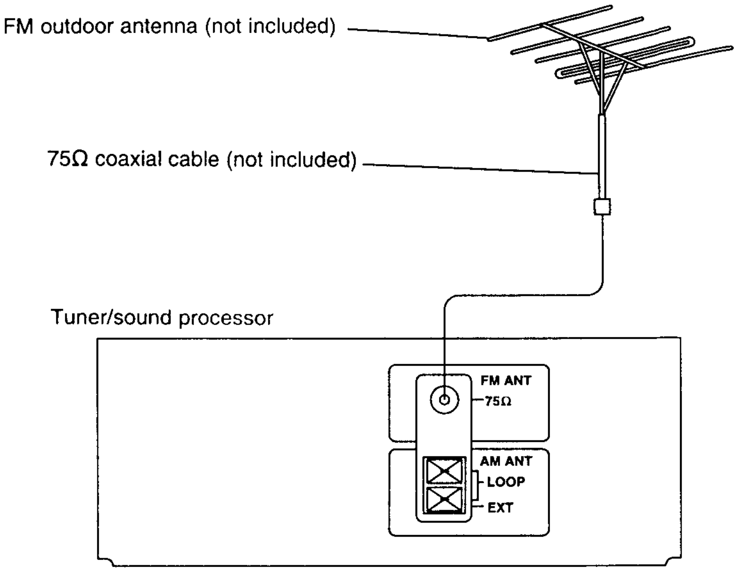
### *AM (MW/LW) outdoor antenna (not included)* B

An outdoor antenna may be required in a mountainous region, or if this system is located inside a reinforced-concrete building, etc.

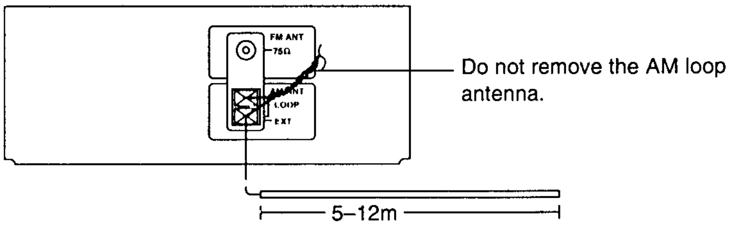
Connect the outdoor antenna without removing the AM loop antenna.
Run 5 to 12 m of vinyl-covered wire horizontally along a window or other convenient location.

**(To be continued)**

**A**


FM outdoor antenna (not included)
75Ω coaxial cable (not included)
Tuner/sound processor
FM ANT
75Ω
AM ANT
LOOP
EXT

**B**


FM ANT
75Ω
AM ANT
LOOP
EXT
Do not remove the AM loop antenna.
5–12m

**(Continued)**

## External unit connection

- For details, refer to the Operating Instructions of the units which are to be connected.
- When units other than those described below are to be connected, please consult with your audio dealer.

**Connecting the stereo connection cable** (not included) **A**
Connect the red plug to the right (R) connector.
Connect the white plug to the left (L) connector.

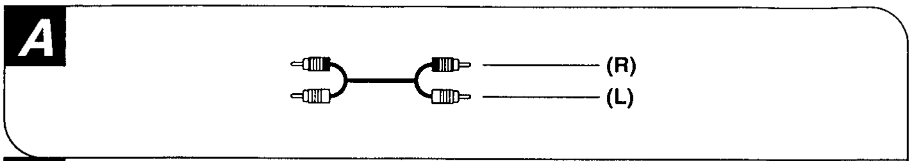
## DCC (digital compact cassette deck) B

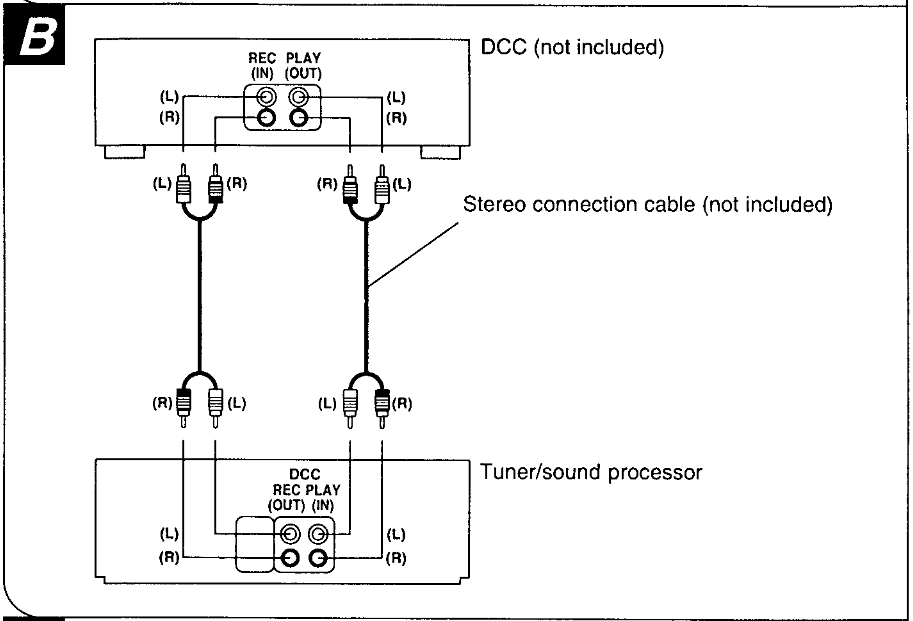
## Analog player

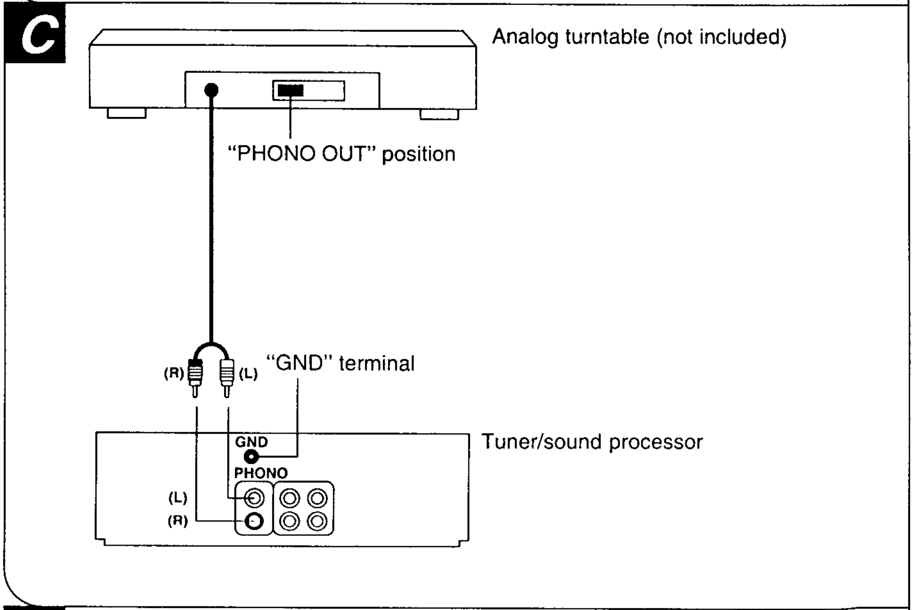
This example shows how to connect the analog player with the PHONO OUT/LINE OUT switch.

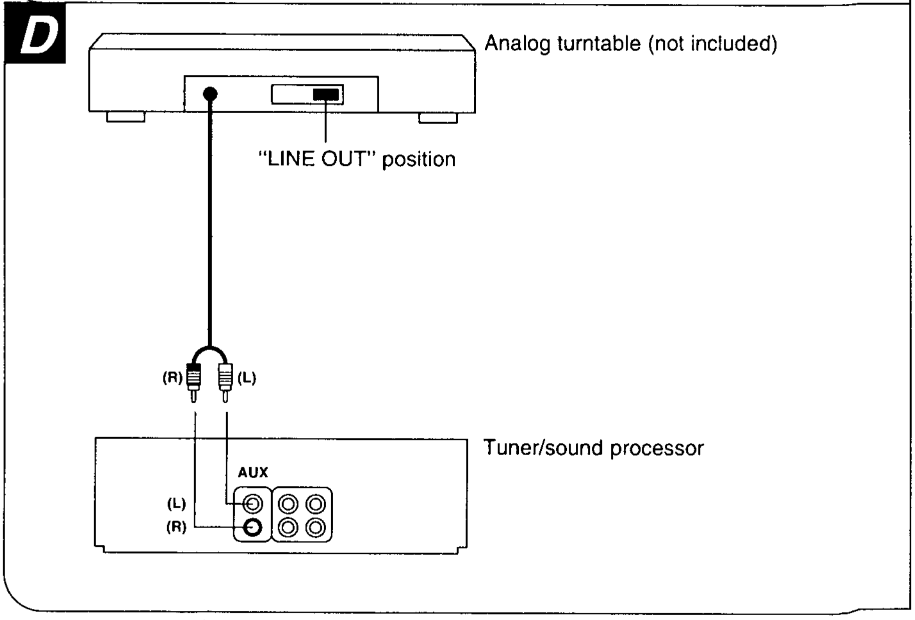
**For Continental Europe:** **C**
"GND" terminal is for a ground wire use.
Set the PHONO OUT position at the back of the analog turntable.

**For others:** **D**
Only an analog turntable with a built-in phono equalizer can be connected.
Set the LINE OUT position at the back of the analog turntable.




B
DCC (not included)
REC PLAY
(IN) (OUT)
(L)
(R)
(L)
(R)
(L) (R)
(R) (L)
Stereo connection cable (not included)
(R) (L)
(L) (R)
Tuner/sound processor
DCC
REC PLAY
(OUT) (IN)
(L)
(R)
(L)
(R)


C
Analog turntable (not included)
"PHONO OUT" position
(R) (L)
"GND" terminal
Tuner/sound processor
GND
PHONO
(L)
(R)


D
Analog turntable (not included)
"LINE OUT" position
(R) (L)
Tuner/sound processor
AUX
(L)
(R)

## ■ Location of Controls

① **Power "STANDBY ⏻/ON" switch (POWER, STANDBY ⏻/ON)**
Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.

② **Standby indicator (STANDBY)**
When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.

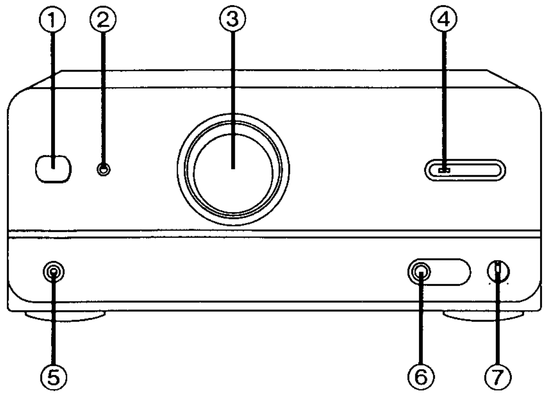
③ **Volume control**

④ **Power indicator**

⑤ **Headphones jack** (φ 3.5, 32 Ω)

⑥ **Microphone jack** (φ 6.3, 600 Ω)

⑦ **Microphone volume control**



## ■ Power Source ON/OFF of This Unit SE-CH510

1. **Connect the AC power cord of this unit to an AC outlet and turn it on. (This unit comes to stand-by mode.)**
2. **Make test point TP701 ( TP701 ) short as shown in Fig. 1. POWER indicator lights and this unit comes to power ON mode.**

**Opration Check**

1. Set this unit to power ON mode.
2. Input a signal (1 kHz, 100 mV) to the section between the resistor **R611** (LINE IN for L-ch) and the capacitor **C906** (LINE IN GND) as well as the section between the resistor **R612** (LINE IN R-ch) and the capacitor **C906** (LINE IN GND).
3. Connect the speaker to the speaker terminals and check if it sounds from the speaker.

(Main P.C.B.)

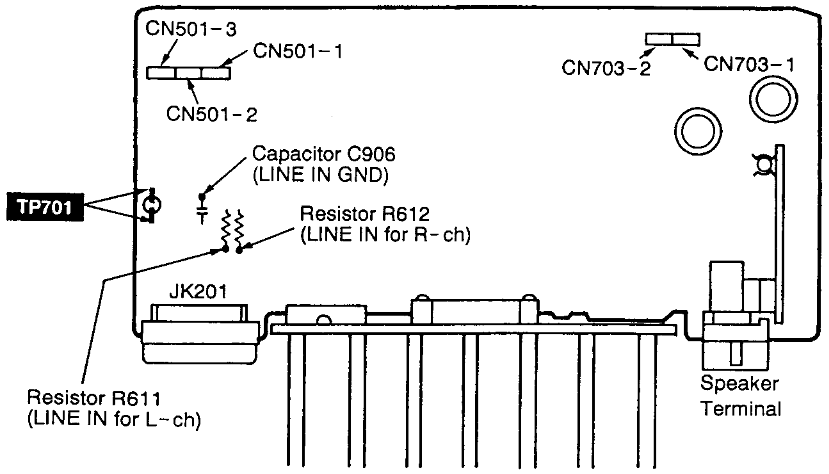


Fig. 1

## ■ Operation Check and Main Component Replacement Procedures

**NOTE**

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Illustrated screws are equivalent to actual size.**
5. **Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.**

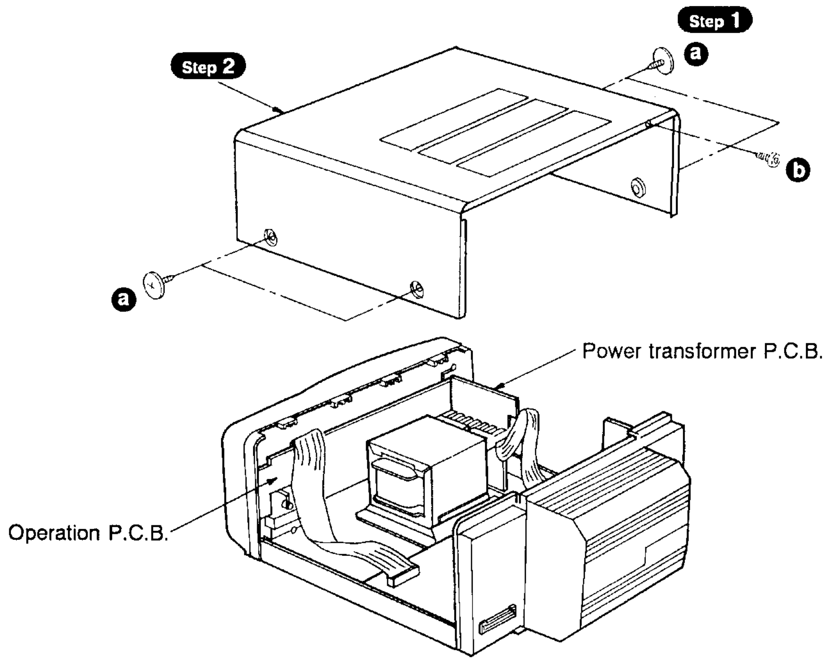
### ● Contents

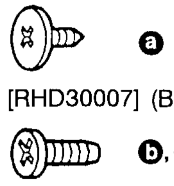
Page

- **Checking Procedure for each P.C.B.**
  1. Checking for the operation P.C.B. and power transformer P.C.B. ........ 12.
  2. Checking for the main P.C.B. ........ 13.
- **Main Component Replacement Procedures**
  1. Replacement for the power IC and regulator transistors ........ 13.

## ■ Checking Procedure for each P.C.B.

### 1. Checking for the operation P.C.B. and power transformer P.C.B.





[RHD30007] (Black)

[XTBS3+8JFZ1] (Black)

## ■ Operation Check and Main Component Replacement Procedures

**NOTE**

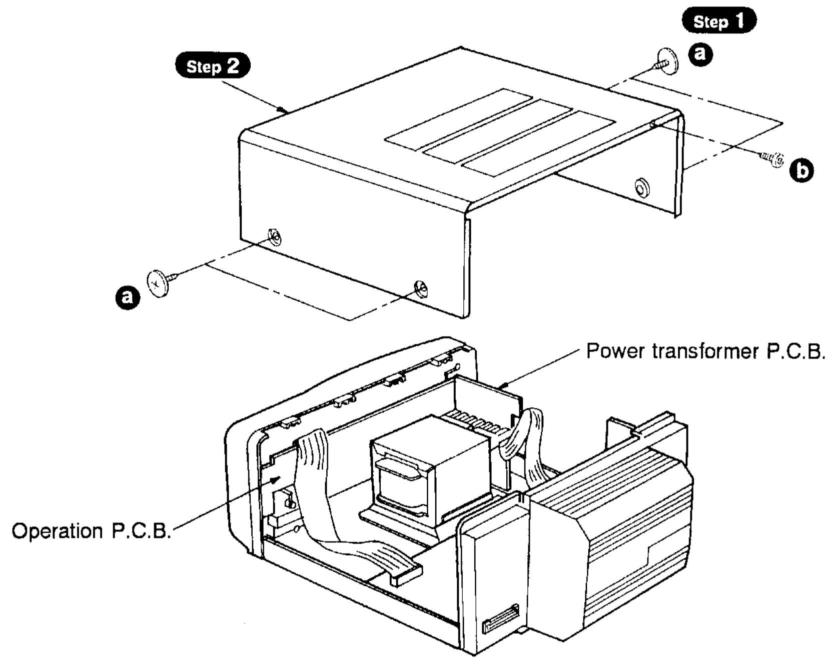
1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Illustrated screws are equivalent to actual size.**
5. **Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.**

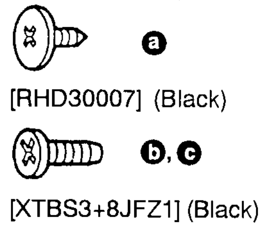
### ● Contents

Page
- **Checking Procedure for each P.C.B.**
  1. Checking for the operation P.C.B. and power transformer P.C.B. ........ 12.
  2. Checking for the main P.C.B. ........ 13.
- **Main Component Replacement Procedures**
  1. Replacement for the power IC and regulator transistors ........ 13.

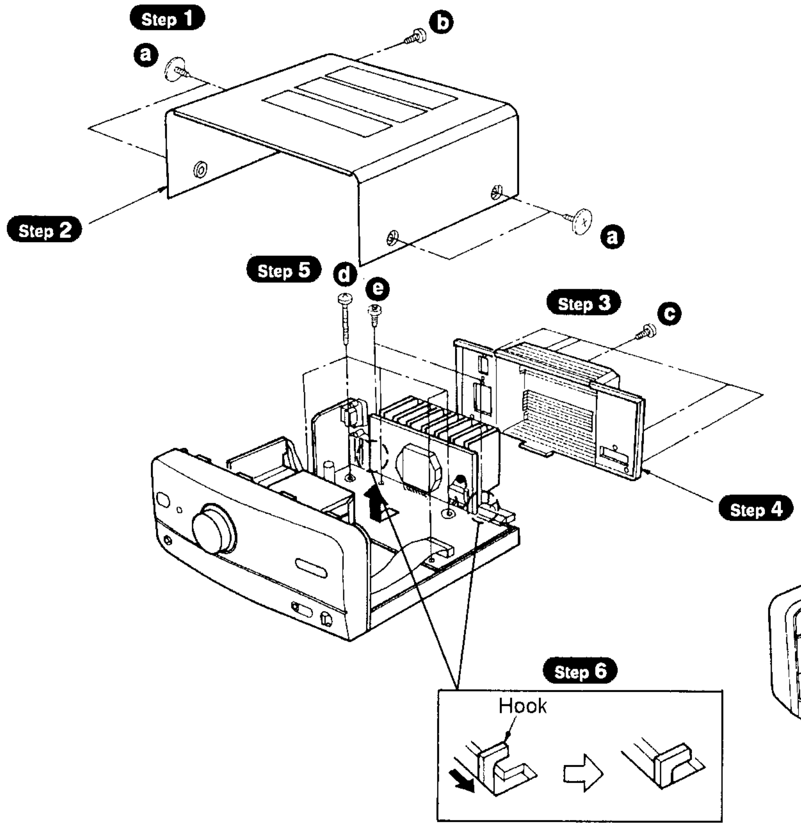
## ■ Checking Procedure for each P.C.B.

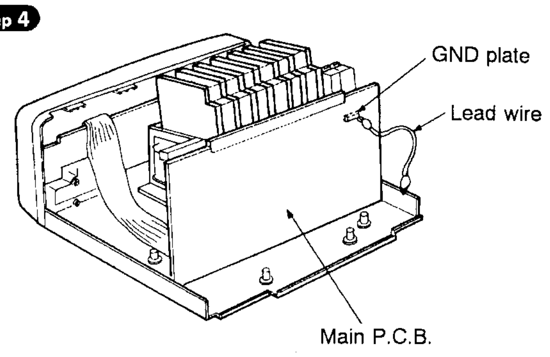
### 1. Checking for the operation P.C.B. and power transformer P.C.B.

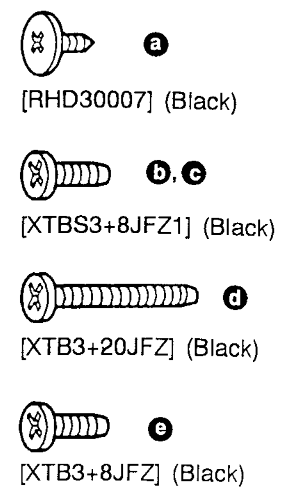

Step 1
a
Step 2
b
a
Power transformer P.C.B.
Operation P.C.B.


a
[RHD30007] (Black)
b, c
[XTBS3+8JFZ1] (Black)

### 2. Checking for the main P.C.B.


Step 1
a
b
Step 2
a
Step 5
d
e
Step 3
c
Step 4
Step 6
Hook

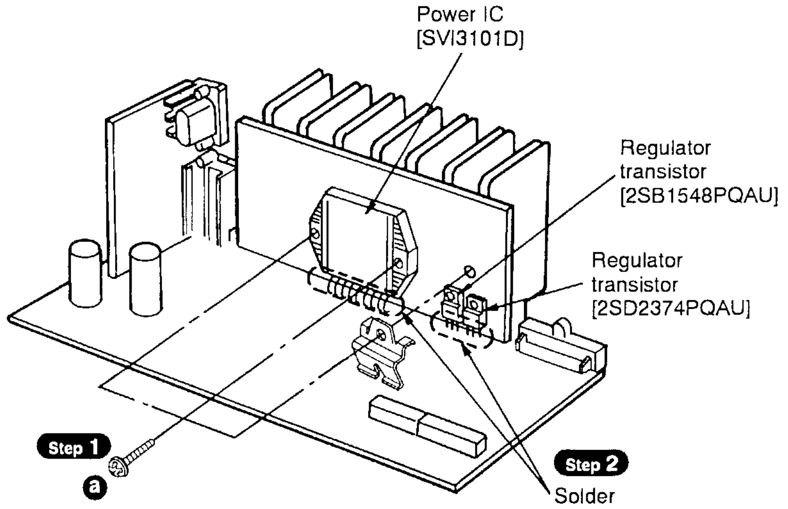

GND plate
Lead wire
Main P.C.B.


a
[RHD30007] (Black)
b, c
[XTBS3+8JFZ1] (Black)
d
[XTB3+20JFZ] (Black)
e
[XTB3+8JFZ] (Black)

## ■ Main Component Replacement Procedures

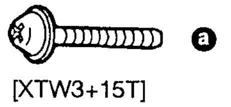
### 1. Replacement for the power IC and regulator transistors

- Follow the item 2 in checking procedure for each P.C.B. on this page.

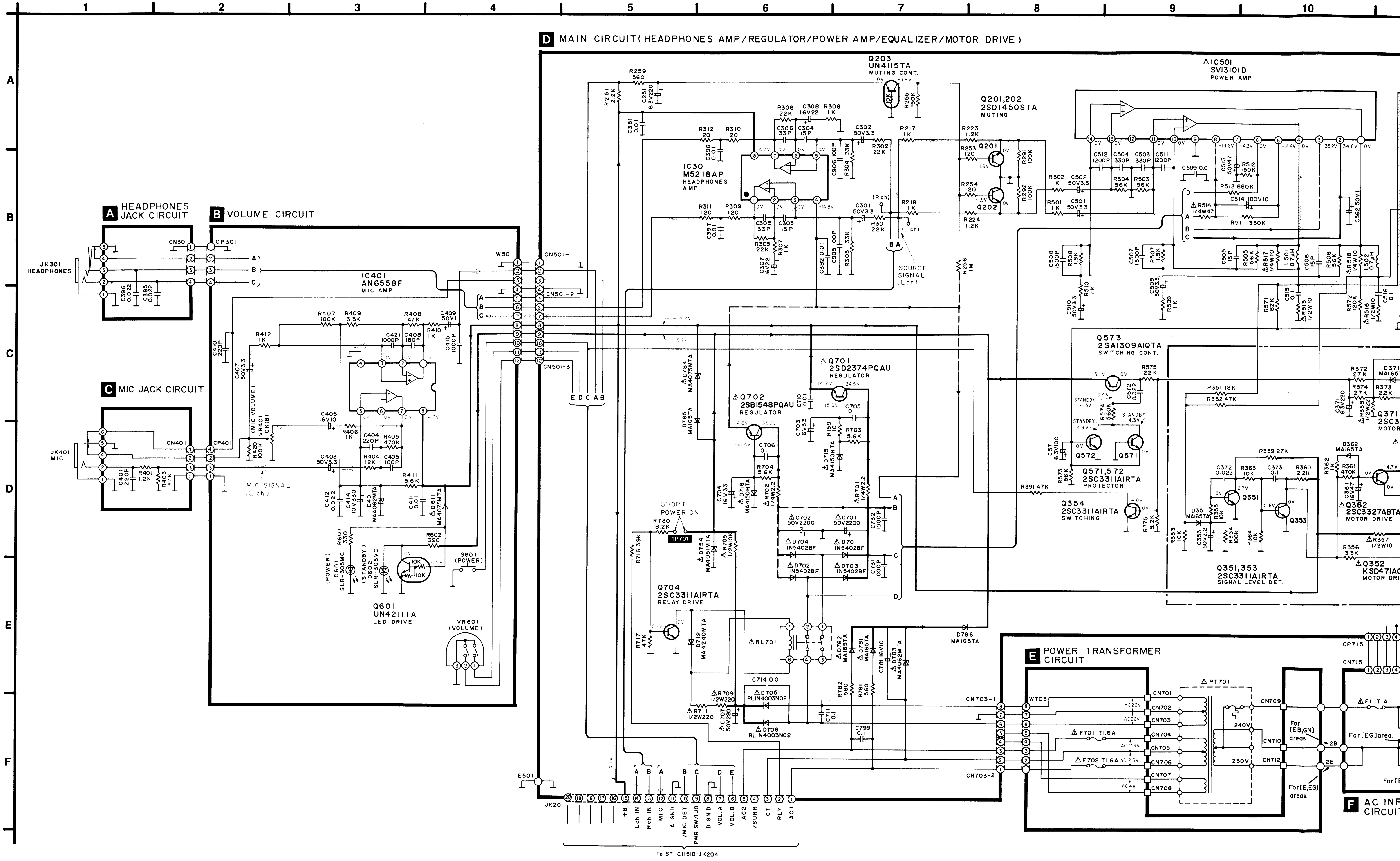

Power IC
[SVI3101D]
Regulator transistor
[2SB1548PQAU]
Regulator transistor
[2SD2374PQAU]
Step 1
a
Step 2
Solder

**NOTE**

When mounting the power IC or regulator transistor, apply silicone compound (RFKX0002) to the rear side of power IC or regulator transistors.

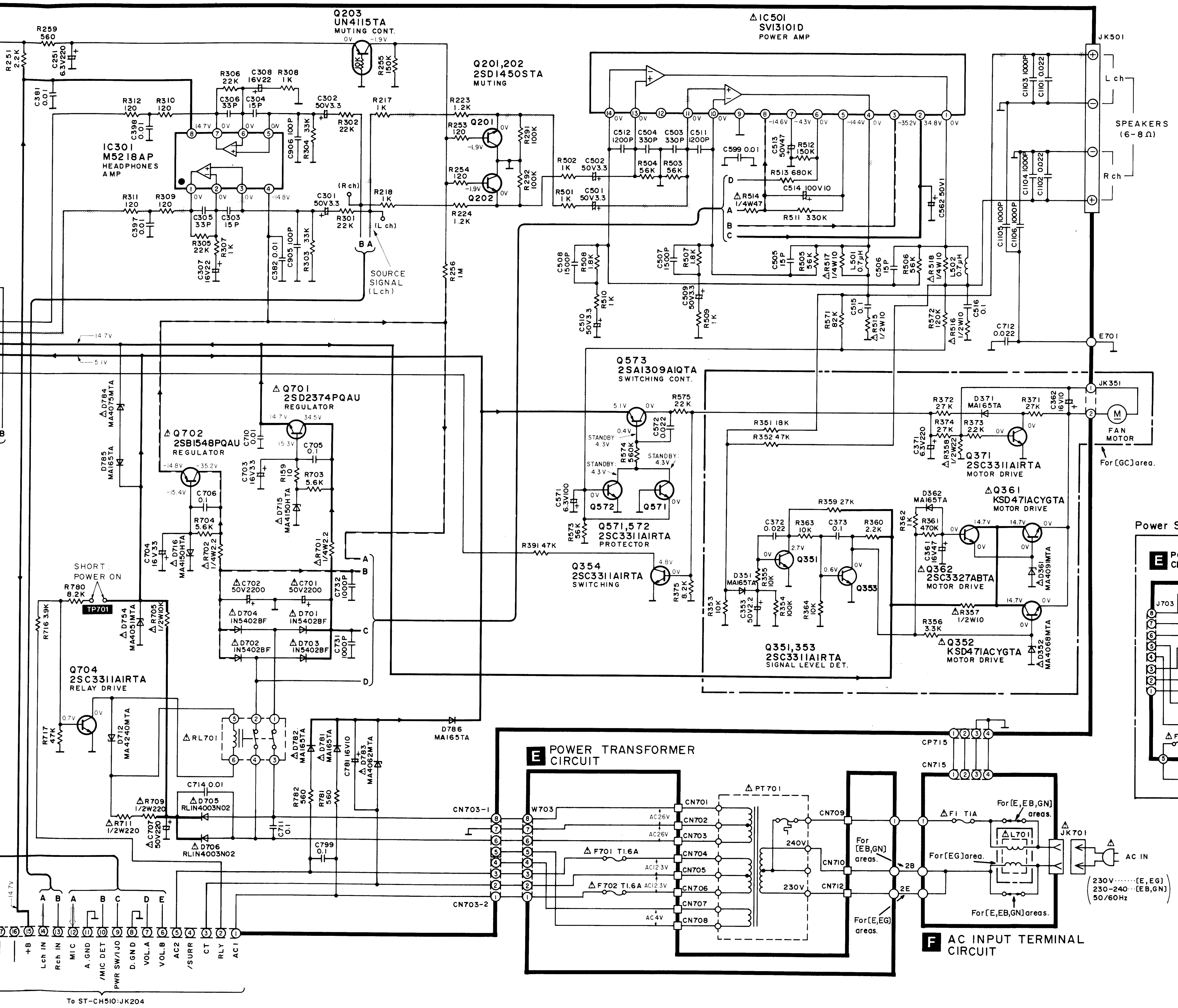


## ■ Schematic Diagram (Parts list on Page 22～24)


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
D MAIN CIRCUIT(HEADPHONES AMP/REGULATOR/POWER AMP/EQUALIZER/MOTOR DRIVE)
A HEADPHONES JACK CIRCUIT
B VOLUME CIRCUIT
C MIC JACK CIRCUIT
E POWER TRANSFORMER CIRCUIT
F AC INF CIRCUIT
JK301 HEADPHONES
JK401 MIC
CN301
CP301
CN401
CP401
W501
CN501-1
CN501-2
CN501-3
IC401 AN6558F MIC AMP
IC301 M5218AP HEADPHONES AMP
Q203 UN4115TA MUTING CONT.
Q201,202 2SD1450STA MUTING
△IC501 SV13101D POWER AMP
Q573 2SA1309AIQTA SWITCHING CONT.
Q571,572 2SC3311AIRTA PROTECTOR
Q354 2SC3311AIRTA SWITCHING
Q351,353 2SC3311AIRTA SIGNAL LEVEL DET.
△Q362 2SC3327ABTA MOTOR DRIVE
△Q352 KSD471AC MOTOR DRI
Q371 2SC3 MOTOR
△Q701 2SD2374PQAU REGULATOR
△Q702 2SB1548PQAU REGULATOR
Q704 2SC3311AIRTA RELAY DRIVE
Q601 UN4211TA LED DRIVE
D601 SLR-305MC (POWER)
D602 SLR-305VC (STANDBY)
S601 (POWER)
VR601 (VOLUME)
VR401 10K(B) (MIC VOLUME)
△RL701
△PT701
△F701 T1.6A
△F702 T1.6A
△F1 T1A
SHORT POWER ON
TP701
MIC SIGNAL (L ch)
SOURCE SIGNAL (L ch)
(R ch)
(L ch)
240V
230V
For [EB,GN] areas.
For [E,EG] areas.
For [EG] area.
CN703-1
CN703-2
W703
CN701
CN702
CN703
CN704
CN705
CN706
CN707
CN708
CN709
CN710
CN712
CP715
CN715
E501
JK201
+B
Lch IN
Rch IN
MIC
A.GND /MIC DET
PWR SW/1JO
D.GND
VOL.A
VOL.B
AC2 /SURR
CT
RLY
AC1
To ST-CH510:JK204
D786 MA165TA
△D705 RLIN4003N02
△D706 RLIN4003N02
△D704 1N5402BF
△D701 1N5402BF
△D702 1N5402BF
△D703 1N5402BF
△C702 50V2200
△C701 50V2200
△C707 50V220
△R709 1/2W220
△R711 1/2W220
C714 0.01
C799 0.1
R780 8.2K
R716 3.9K
R717 47K
△D754 MA4051MTA
△R705 1/2W10K
D712 MA4240MTA
△D782 MA165TA
△D781 MA165TA
C781 16V10
△D783 MA4062MTA
R782 560
R781 560
D784 MA4075MTA
D785 MA165TA
D715 MA4150HTA
D716 MA4160HTA
△R702 1/4W2.2
△R701 1/4W2.2
R159 10
R703 5.6K
R704 5.6K
C706 0.1
C705 0.1
C703 16V33
C704 16V33
C710 0.01
C731 100P
C732 100P
R236 1M
R391 47K
STANDBY 4.3V
STANDBY 4.3V
R575 22K
R574 560K
C572 0.022
C571 6.3V100
R573 56K
R359 27K
R351 18K
R352 47K
R363 10K
R360 2.2K
C372 0.022
C373 0.1
D351 MA165TA
R355 10K
R354 100K
C353 50V2.2
R353 10K
R364 10K
R375 8.2K
R372 27K
R374 27K
R373
D371 MA165
C371 63V220
R358 1/2W2
R362 1K
R361 470K
D362 MA165TA
C361 16V47
R357 1/2W10
R356 3.3K
R259 560
R251 2.2K
C251 63V220
C381 0.01
R306 22K
C308 16V22
R308 1K
C306 33P
C304 15P
R312 120
R310 120
C398 0.01
C302 50V3.3
R302 22K
C906 100P
R304 33K
R217 1K
R255 150K
R223 1.2K
R253 120
R291 100K
R254 120
R292 100K
R224 1.2K
R218 1K
C301 50V3.3
R301 22K
R311 120
R309 120
C397 0.01
C305 33P
C303 15P
R305 22K
R307 1K
C307 16V22
C382 0.01
C905 100P
R303 33K
C512 1200P
C504 330P
C503 330P
C511 1200P
C599 0.01
C513 50V47
R512 150K
R513 680K
C514 100V10
△R514 1/4W47
R511 330K
C562 50V1
R502 1K
C502 50V3.3
R504 56K
R503 56K
R501 1K
C501 50V3.3
C508 1500P
R508 1.8K
C510 50V3.3
R510 1K
C507 1500P
R507 1.8K
C509 50V3.3
R509 1K
C505 15P
R505 56K
△R517 1/4W10
L501 0.7μH
C506 15P
R506 56K
△R518 1/4W10
L502 0.7μH
R571 82K
C515 0.1
△R515 1/2W10
R572 120K
△R516 1/2W10
C516 0.1
C396 0.022
C395 0.022
C401 22P
R401 1.2K
R403 47K
R420 100K
C410 220
C407 50V3.3
R412 1K
R407 100K
R409 3.3K
R408 47K
C409 50V1
C421 1000P
C408 180P
R410 1K
C415 1000P
C406 16V10
R406 1K
C404 220P
R405 470K
C403 50V3.3
R404 12K
C405 100P
R411 5.6K
C412 0.022
C414 10V330
D401 MA4062MTA
C411 0.01
△D611 MA4075MTA
R601 330
R602 390
AC26V
AC26V
AC12.3V
AC12.3V
AC4V

5
6
7
8
9
10
11
12
13
14

IRCUIT( HEADPHONES AMP/REGULATOR/POWER AMP/EQUALIZER/MOTOR DRIVE )


Q203 UN4115TA MUTING CONT.
Q201,202 2SD1450STA MUTING
ΔIC501 SVI3101D POWER AMP
IC301 M5218AP HEADPHONES AMP
JK501
L ch
R ch
SPEAKERS (6-8Ω)
E701
Q573 2SA1309AIQTA SWITCHING CONT.
ΔQ701 2SD2374PQAU REGULATOR
ΔQ702 2SB1548PQAU REGULATOR
Q571,572 2SC3311AIRTA PROTECTOR
Q354 2SC3311AIRTA SWITCHING
JK351
FAN MOTOR
For [GC] area.
Q371 2SC3311AIRTA MOTOR DRIVE
ΔQ361 KSD471ACYGTA MOTOR DRIVE
ΔQ362 2SC3327ABTA MOTOR DRIVE
Q351,353 2SC3311AIRTA SIGNAL LEVEL DET.
ΔQ352 KSD471ACYGTA MOTOR DRIVE
SOURCE SIGNAL (L ch)
SHORT POWER ON
TP701
Q704 2SC3311AIRTA RELAY DRIVE
ΔRL701
D786 MA165TA
CP715
CN715
E POWER TRANSFORMER CIRCUIT
ΔPT701
ΔF701 T1.6A
ΔF702 T1.6A
CN703-1
CN703-2
W703
For [EB,GN] areas.
For [E,EG] areas.
For [E,EB,GN] areas.
For [EG] area.
ΔF1 T1A
ΔL701
ΔJK701
AC IN
230V······[E,EG]
230-240···[EB,GN]
50/60Hz
F AC INPUT TERMINAL CIRCUIT
+B
Lch IN
Rch IN
MIC
A.GND /MIC DET
PWR SW/I.JO
D.GND
VOL.A
VOL.B
AC2 /SURR
CT
RLY
AC1
To ST-CH510:JK204

- This schematic diagram may be modified at any time with the development of new technology.

**Notes:**

- **S601** : Power switch (STANDBY ⏻/ON)
- **S701** : Voltage select switch in 220 V position. For (GC) area only.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

  No mark : Power on

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**

  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

- **Voltage and signal line**

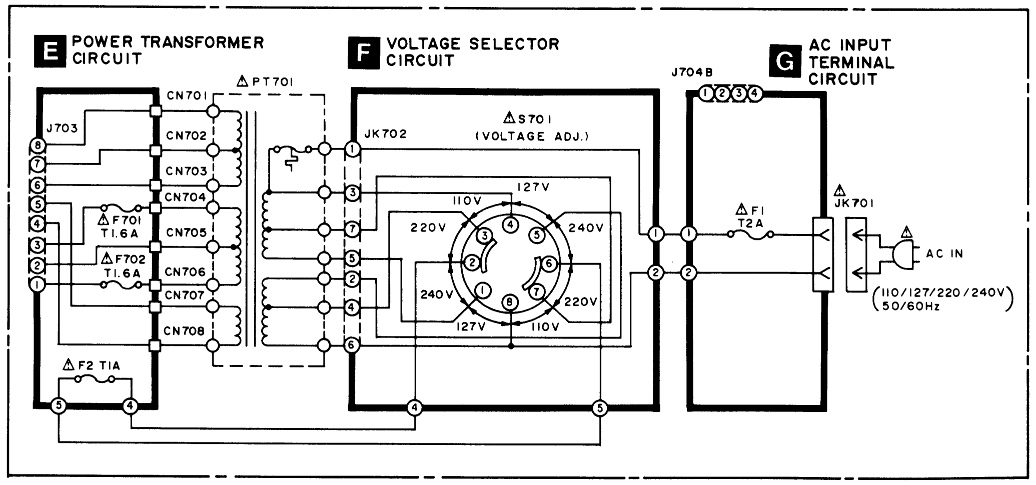
━━►━━ : Positive voltage line

– – ► – – :Negative voltage line

░░░ : Source signal line (L-ch)

⇨ : MIC signal

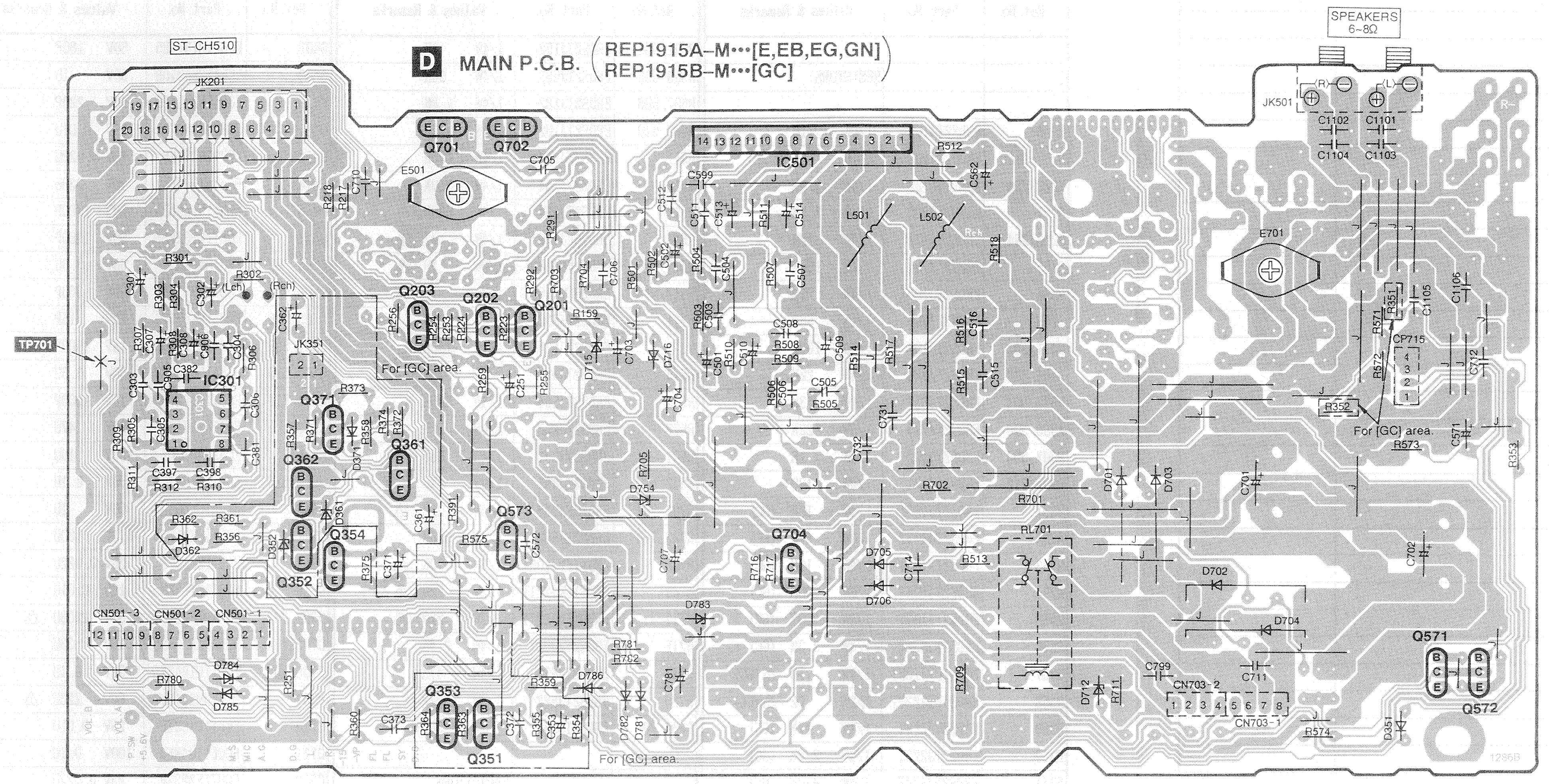
Power Source For [GC] area.


E POWER TRANSFORMER CIRCUIT
F VOLTAGE SELECTOR CIRCUIT
G AC INPUT TERMINAL CIRCUIT
ΔPT701
J703
CN701
CN702
CN703
CN704
CN705
CN706
CN707
CN708
ΔF701 T1.6A
ΔF702 T1.6A
ΔF2 T1A
JK702
ΔS701 (VOLTAGE ADJ.)
110V
127V
220V
240V
J704B
ΔJK701
ΔF1 T2A
AC IN
(110/127/220/240V 50/60Hz)

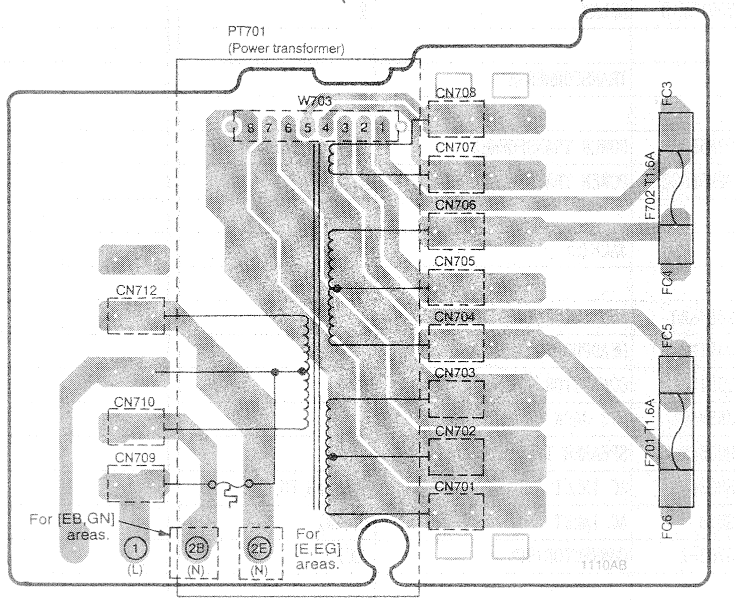
## Printed Circuit Board Diagram

- This circuit board diagram may be modified at any time with the development of new technology.

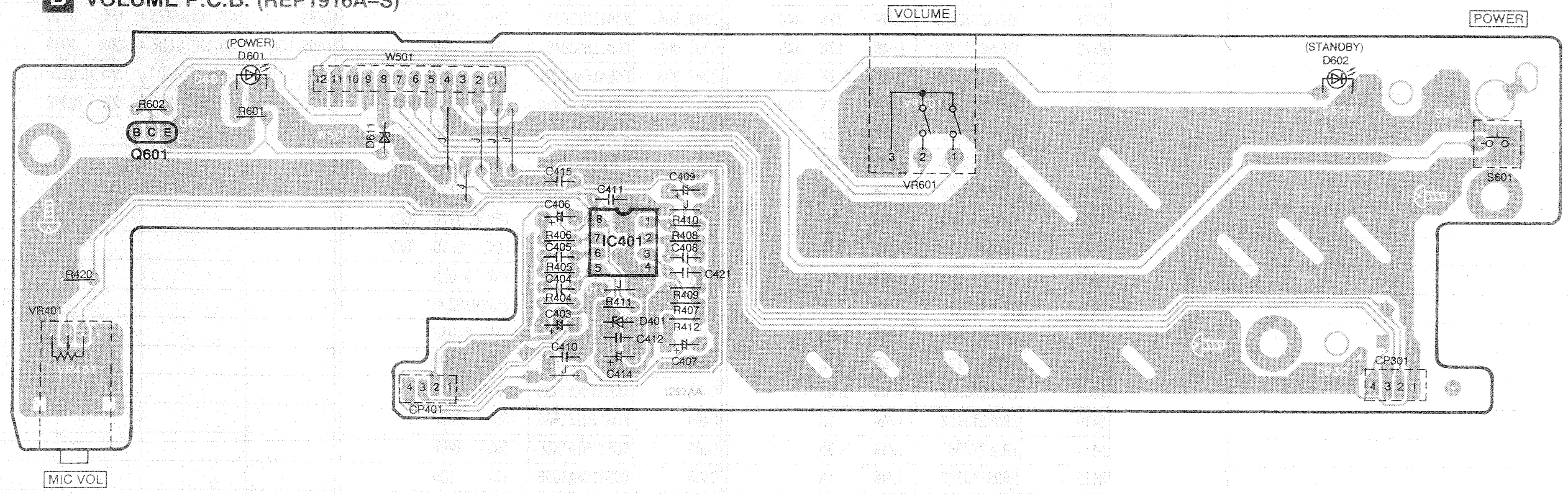
**D** MAIN P.C.B. (REP1915A–M•••[E,EB,EG,GN]
REP1915B–M•••[GC])


1
2
3
4
5
6
7
A
B
C
D
ST–CH510
SPEAKERS 6~8Ω
JK501
JK201
TP701
Q701
Q702
IC501
E501
E701
L501
L502
Rch
Q203
Q202
Q201
IC301
JK351
(Lch)
(Rch)
Q371
Q361
Q362
Q354
Q352
Q573
Q704
RL701
Q571
Q572
Q353
Q351
For [GC] area.
CN501–3
CN501–2
CN501–1
CN703–2
CN703–1
CP715
D701
D702
D703
D704
D705
D706
D783
D784
D785
D786
C1101
C1102
C1103
C1104
C1105
C1106

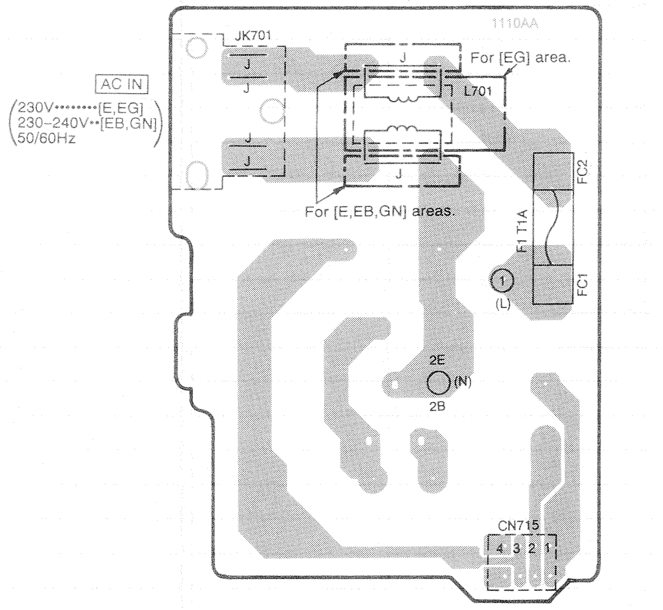
**E** POWER TRANSFORMER P.C.B. (REP1914A–P•••[EG]
REP1914B–P•••[E]
REP1914C–P•••[EB]
REP1914D–P•••[GN])

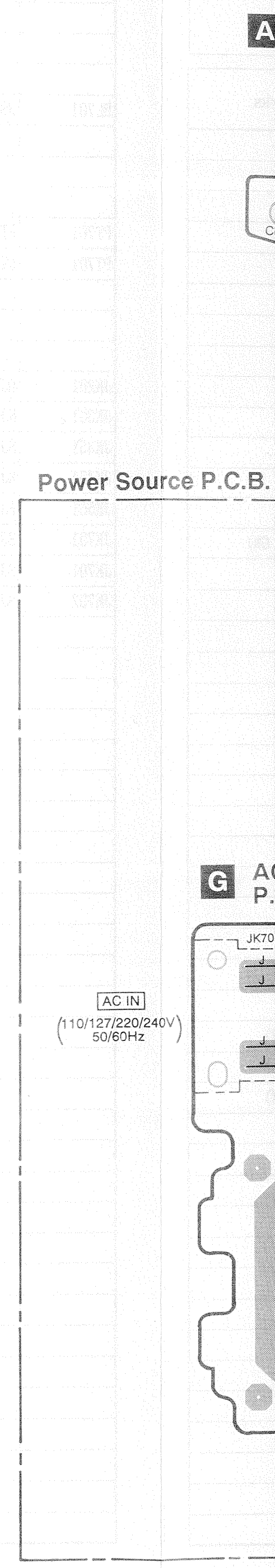

PT701
(Power transformer)
W703
CN701
CN702
CN703
CN704
CN705
CN706
CN707
CN708
CN709
CN710
CN712
F701 T1.6A
F702 T1.6A
FC3
FC4
FC5
FC6
For [EB,GN] areas.
For [E,EG] areas.
1110AB

**B** VOLUME P.C.B. (REP1916A–S)


VOLUME
POWER
(POWER)
D601
W501
R602
R601
Q601
D611
(STANDBY)
D602
S601
VR601
IC401
VR401
R420
CP401
CP301
1297AA
MIC VOL

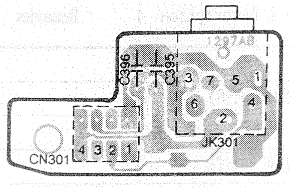
**F** AC INPUT TERMINAL P.C.B. (REP1914A–P•••[EG]
REP1914B–P•••[E]
REP1914C–P•••[EB]
REP1914D–P•••[GN])


AC IN
(230V••••••••[E,EG]
230–240V••[EB,GN]
50/60Hz)
JK701
For [EG] area.
L701
For [E,EB,GN] areas.
F1 T1A
FC1
FC2
2E
2B
CN715
1110AA

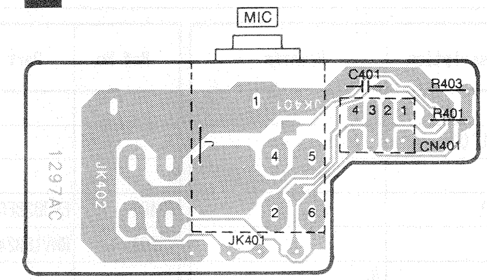

10
A
Power Source P.C.B.
AC IN
(110/127/220/240V
50/60Hz)
G
JK70

10 11 12 13 14

## A HEADPHONES JACK P.C.B. (REP1916A–S)


PHONES
C396
C395
1297AB
JK301
CN301
4 3 2 1

## C MIC JACK P.C.B. (REP1916A–S)

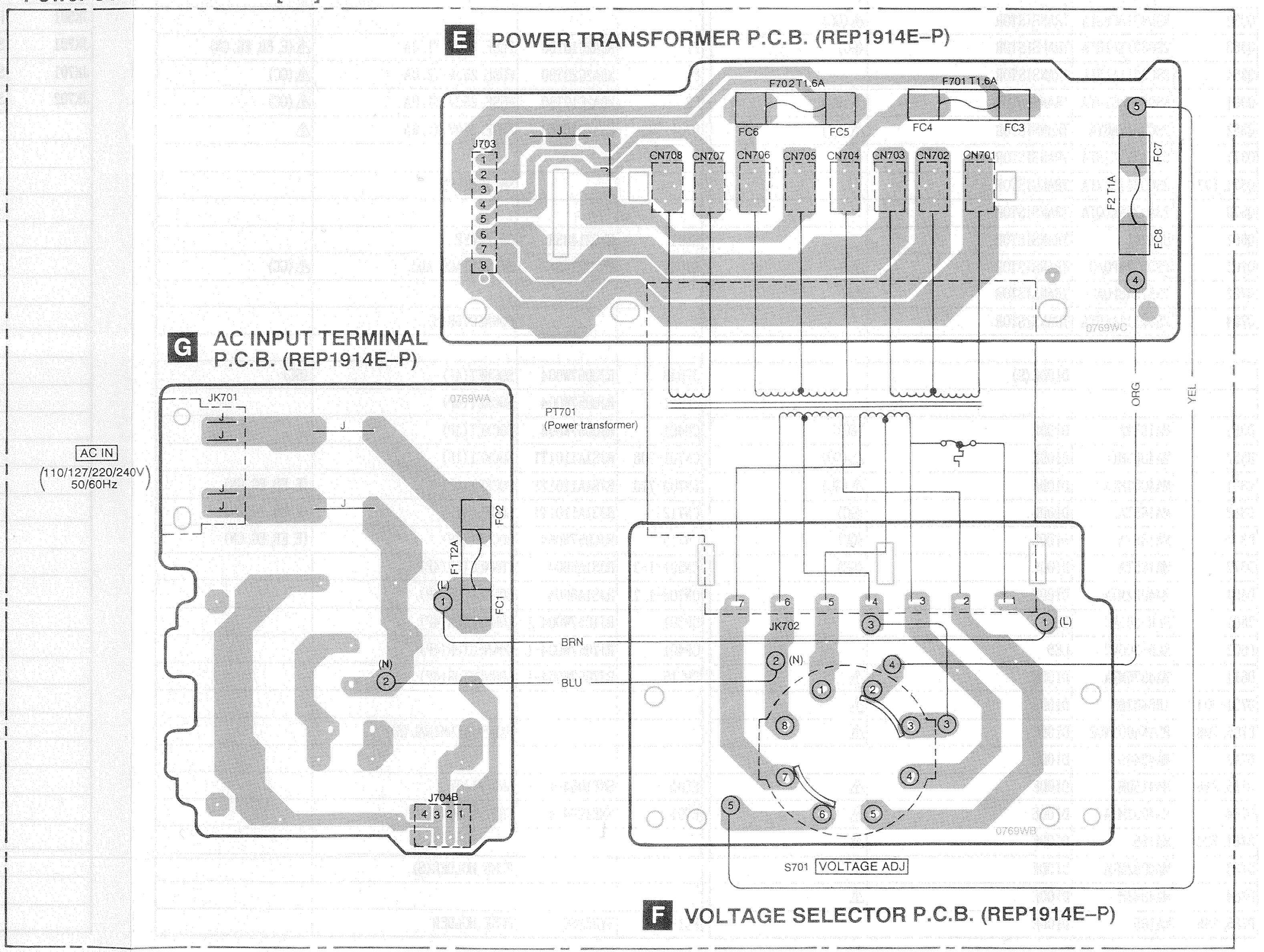

MIC
C401
R403
R401
CN401
4 3 2 1
JK401
JK402
1297AC

## Power Source P.C.B. For [GC] area.

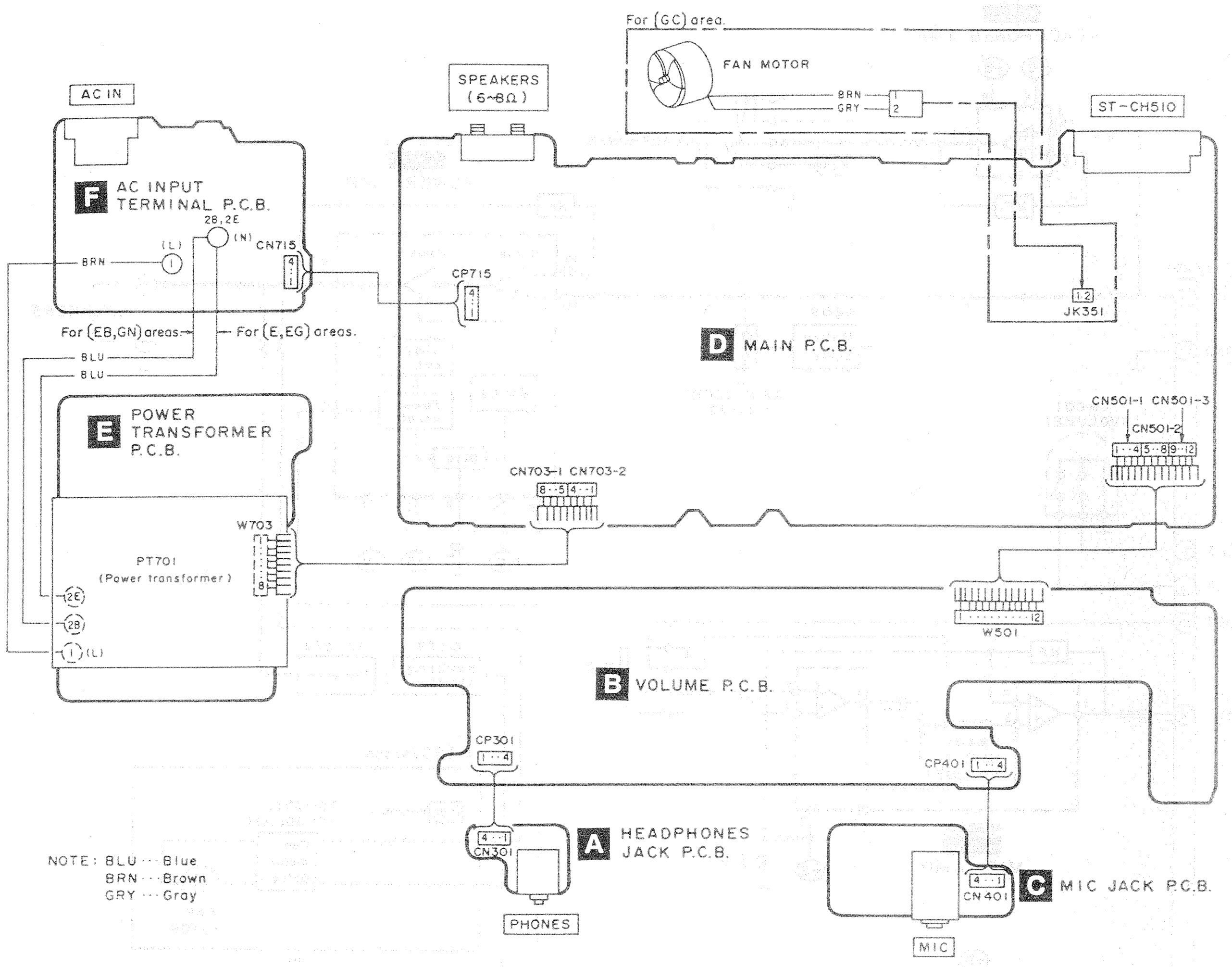
## E POWER TRANSFORMER P.C.B. (REP1914E–P)

## G AC INPUT TERMINAL P.C.B. (REP1914E–P)

## F VOLTAGE SELECTOR P.C.B. (REP1914E–P)

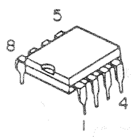
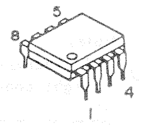
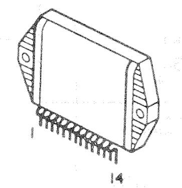
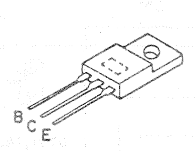
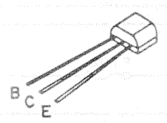
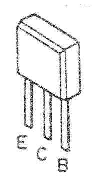
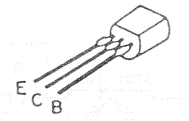
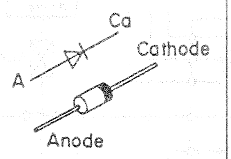
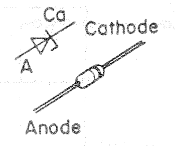
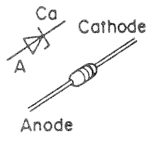
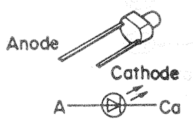
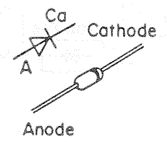

AC IN
(110/127/220/240V 50/60Hz)
JK701
J
FC2
F1 T2A
FC1
(L)
(N)
J704B
4 3 2 1
0769WA
PT701
(Power transformer)
BRN
BLU
ORG
YEL
J703
F702 T1.6A
F701 T1.6A
FC6
FC5
FC4
FC3
CN708
CN707
CN706
CN705
CN704
CN703
CN702
CN701
F2 T1A
FC7
FC8
0769WC
JK702
S701 VOLTAGE ADJ
0769WB

## ■ Wiring Connection Diagram

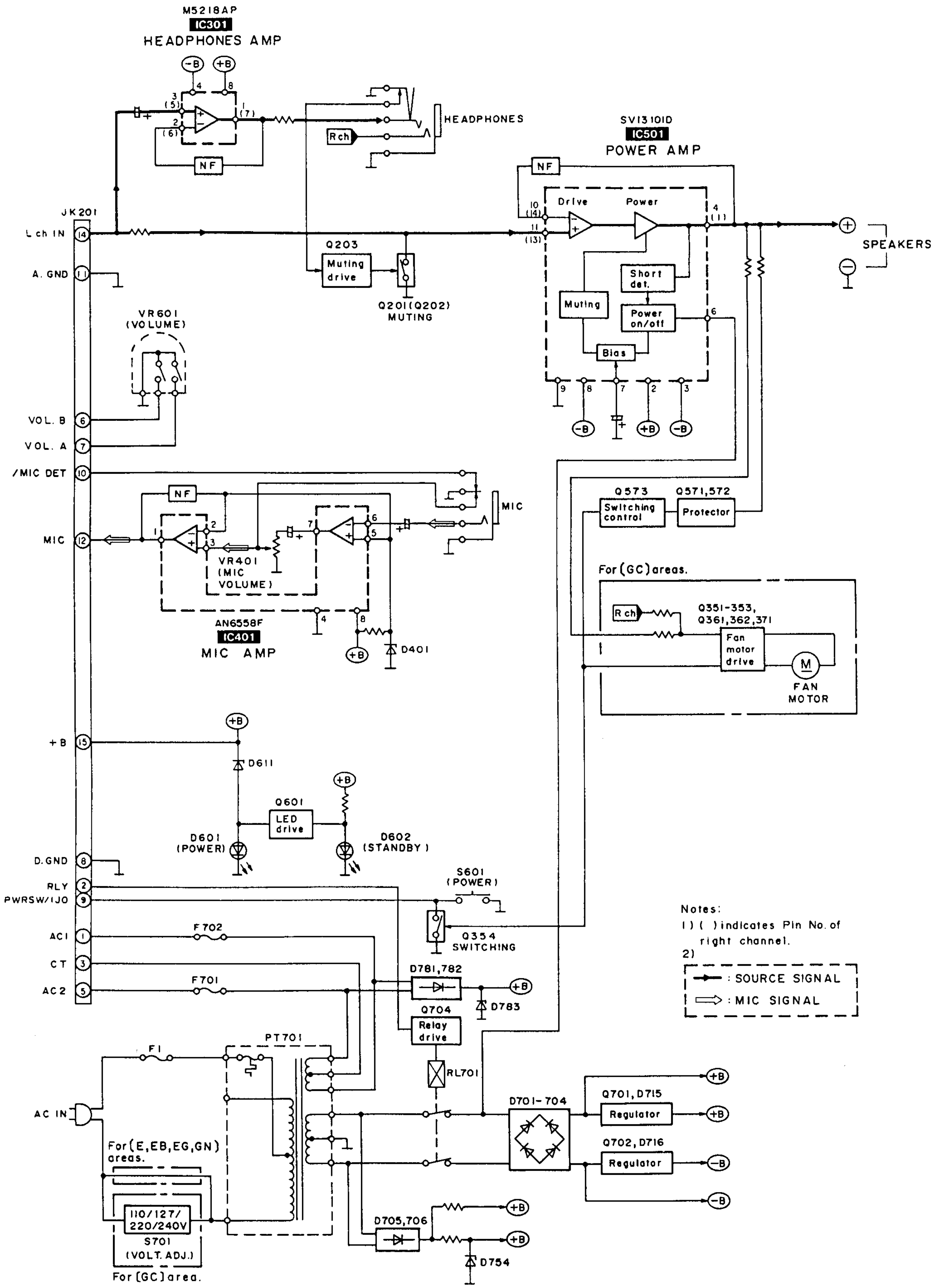

For (GC) area.
FAN MOTOR
BRN
GRY
SPEAKERS (6~8Ω)
ST-CH510
AC IN
F AC INPUT TERMINAL P.C.B.
2B,2E
(L)
(N)
CN715
BRN
CP715
JK351
D MAIN P.C.B.
For (EB,GN) areas
For (E,EG) areas.
BLU
BLU
E POWER TRANSFORMER P.C.B.
PT701
(Power transformer)
W703
(2E)
(2B)
(L)
CN703-1 CN703-2
CN501-1 CN501-3
CN501-2
W501
B VOLUME P.C.B.
CP301
CP401
CN301
A HEADPHONES JACK P.C.B.
PHONES
C MIC JACK P.C.B.
CN401
MIC

NOTE: BLU···Blue
BRN···Brown
GRY···Gray

- Terminal Guide of IC's, Transistors and Diodes

| AN6558F | M5218AP | SVI3101D | 2SB1548PQAU<br>2SD2374PQAU | 2SC3327ABTA |
|---|---|---|---|---|
|  |  |  |  |  |
|  | UN4115<br>UN4211<br>2SA1309AIQTA<br>2SC3311AIRTA<br>2SD1450RTA | KSD471ACYGTA<br> | 1N5402BF<br>RL1N4003N02<br>  Ca<br>Cathode<br>A<br>Anode | MA4150M<br>MA4240H<br>  Ca<br>Cathode<br>A<br>Anode |
|   Ca<br>Cathode<br>A<br>Anode | MA4051MTA<br>MA4062MTA<br>MA4068M<br>MA4075MTA<br>MA4091MTA | SLR-305VC<br>SLR-305MC<br>  Anode<br>Cathode<br>A<br>Ca | MA165TA<br>  Ca<br>Cathode<br>A<br>Anode | |

# ■ Block Diagram


M5218AP
IC301
HEADPHONES AMP
HEADPHONES
Rch
NF
SVI3101D
IC501
POWER AMP
Drive
Power
Short det.
Muting
Power on/off
Bias
SPEAKERS
JK201
L ch IN
A. GND
VOL. B
VOL. A
/MIC DET
MIC
+B
D.GND
RLY
PWRSW/IJO
AC1
CT
AC2
AC IN
Q203
Muting drive
Q201(Q202) MUTING
VR601 (VOLUME)
VR401 (MIC VOLUME)
AN6558F
IC401
MIC AMP
D401
Q573
Q571,572
Switching control
Protector
For (GC) areas.
Q351-353, Q361,362,371
Fan motor drive
FAN MOTOR
D611
Q601
LED drive
D601 (POWER)
D602 (STANDBY)
S601 (POWER)
Q354 SWITCHING
F702
F701
D781,782
D783
Q704
Relay drive
RL701
F1
PT701
For (E,EB,EG,GN) areas.
110/127/220/240V
S701 (VOLT. ADJ.)
For (GC) area.
D701-704
Q701, D715
Regulator
Q702, D716
Regulator
D705,706
D754
Notes:
1) ( ) indicates Pin No. of right channel.
2)
: SOURCE SIGNAL
: MIC SIGNAL

# ■ Replacement Parts List

**Notes:** *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Remote Control Ass'y: Supply period for three years from termination of production.
*The "(SF)" mark denotes the standard part.

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | INTEGRATED CIRCUIT(S) | |
| | | | |
| IC301 | M5218AP | I. C, HEADPHONE AMP. | |
| IC401 | AN6558F | I. C, MIC AMP. | |
| IC501 | SVI3101D | I. C, POWER AMP. | ⚠ |
| | | | |
| | | TRANSISTOR(S) | |
| | | | |
| Q201, 202 | 2SD1450RTA | TRANSISTOR | |
| Q203 | UN4115 | TRANSISTOR | |
| Q351 | 2SC3311AIRTA | TRANSISTOR | (GC) |
| Q352 | KSD471ACYGTA | TRANSISTOR | ⚠(GC) |
| Q353 | 2SC3311AIRTA | TRANSISTOR | (GC) |
| Q354 | 2SC3311AIRTA | TRANSISTOR | |
| Q361 | KSD471ACYGTA | TRANSISTOR | ⚠(GC) |
| Q362 | 2SC3327ABTA | TRANSISTOR | ⚠(GC) |
| Q371 | 2SC3311AIRTA | TRANSISTOR | (GC) |
| Q571, 572 | 2SC3311AIRTA | TRANSISTOR | |
| Q573 | 2SA1309AIQTA | TRANSISTOR | |
| Q601 | UN4211 | TRANSISTOR | |
| Q701 | 2SD2374PQAU | TRANSISTOR | ⚠ |
| Q702 | 2SB1548PQAU | TRANSISTOR | ⚠ |
| Q704 | 2SC3311AIRTA | TRANSISTOR | |
| | | | |
| | | DIODE(S) | |
| | | | |
| D351 | MA165TA | DIODE | (GC) |
| D352 | MA4068MTA | DIODE | ⚠(GC) |
| D361 | MA4091MTA | DIODE | ⚠(GC) |
| D362 | MA165TA | DIODE | (GC) |
| D371 | MA165TA | DIODE | (GC) |
| D372 | MA165TA | DIODE | (GC) |
| D401 | MA4062MTA | DIODE | |
| D601 | SLR-305MC | LED | |
| D602 | SLR-305VC | LED | |
| D611 | MA4075MTA | DIODE | ⚠ |
| D701-704 | 1N5402BF | DIODE | ⚠ |
| D705, 706 | RL1N4003N02 | DIODE | ⚠ |
| D712 | MA4240H | DIODE | |
| D715, 716 | MA4150M | DIODE | ⚠ |
| D754 | MA4051MTA | DIODE | ⚠ |
| D781, 782 | MA165 | DIODE | ⚠ |
| D783 | MA4062MTA | DIODE | ⚠ |
| D784 | MA4068M | DIODE | ⚠ |
| D785, 786 | MA165 | DIODE | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | VARIABLE RESISTOR(S) | |
| | | | |
| VR401 | EVJ02BF01B14 | V. R, MIC VOLUME CONTROL | |
| VR601 | RRV16B24104B | V. R, MAIN VOLUME CONTROL | |
| | | | |
| | | COIL(S) | |
| | | | |
| L501, 502 | RLQYR73M | COIL | |
| L701 | RLQZ271M | COIL | ⚠(EG) |
| | | | |
| | | FUSE(S) | |
| | | | |
| F1 | XBA2C10TB0 | FUSE, 250V T1. 0A | ⚠(E, EB, EG, GN) |
| F1 | XBA2C20TB0 | FUSE, 250V T2. 0A | ⚠(GC) |
| F2 | XBA2C10TB0 | FUSE, 250V T1. 0A | ⚠(GC) |
| F701, 702 | XBA2C16TB0 | FUSE, 250V T1. 6A | ⚠ |
| | | | |
| | | SWITCH(ES) | |
| | | | |
| S601 | EVQ21405R | SW, POWER | |
| S701 | ESE37263 | SW, VOLTAGE ADJ. | ⚠(GC) |
| | | | |
| | | CONNECTOR(S) | |
| | | | |
| J704B | RJU057W004 | SOCKET(4P) | (GC) |
| CN301 | RJU057W004 | SOCKET(4P) | |
| CN401 | RJU057W004 | SOCKET(4P) | |
| CN701-708 | RJS1A1101T1 | SOCKET(1P) | |
| CN709, 710 | RJS1A1101T1 | SOCKET(1P) | (E, EB, EG, GN) |
| CN712 | RJS1A1101T1 | SOCKET(1P) | (E, EB, EG, GN) |
| CN715 | RJU057W004 | SOCKET(4P) | (E, EB, EG, GN) |
| CN501-1-3 | RJS1A6604 | CONNECTOR(4P) | |
| CN703-1, 2 | RJS1A6604 | CONNECTOR(4P) | |
| CP301 | RJT057W004-1 | CONNECTOR(4P) | |
| CP401 | RJT057W004-1 | CONNECTOR(4P) | |
| CP715 | RJT057W004-1 | CONNECTOR(4P) | |
| | | | |
| | | EARTH TERMINAL(S) | |
| | | | |
| E501 | SNE1004-1 | GND PLATE | |
| E701 | SNE1004-1 | GND PLATE | |
| | | | |
| | | FUSE HOLDER(S) | |
| | | | |
| FC1-6 | EYF52BC | FUSE HOLDER | |

| Ref. No. | Pa |
|---|---|
| FC7 | EYF52 |
| FC8 | EYF52 |
| | |
| | |
| | |
| RL701 | RSY00 |
| | |
| | |
| | |
| PT701 | RTP2M |
| PT701 | RTP2M |
| | |
| | |
| | |
| JK201 | RJT06 |
| JK301 | RJJ37 |
| JK351 | SJT32 |
| JK401 | RJJ65 |
| JK501 | RJR00 |
| JK701 | SJS92 |
| JK701 | SJSD1 |
| JK702 | SJS70 |

| emarks |
|---|
| EG, GN) |
| GN) |
| GN) |
| GN) |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| FC7 | EYF52BC | FUSE HOLDER | (GC) |
| FC8 | EYF52BC | FUSE HOLDER | (GC) |
| | | RELAY | |
| RL701 | RSY0013M-0 | RELAY | ⚠ |
| | | TRANSFORMER(S) | |
| PT701 | RTP2M5B002 | POWER TRANSFORMER | ⚠(E, EB, EG, GN) |
| PT701 | RTP2M5E002 | POWER TRANSFORMER | ⚠(GC) |
| | | JACK(S) | |
| JK201 | RJT065K20 | CONNECTOR(20P) | |
| JK301 | RJJ37TN01-C | HEADPHONES JACK | |
| JK351 | SJT3213 | CONNECTOR(2P) | (GC) |
| JK401 | RJJ65MA01 | MIC JACK | |
| JK501 | RJR0054M | SPEAKER TERMINAL | |
| JK701 | SJS9236 | AC INLET | ⚠(E, EB, EG, GC) |
| JK701 | SJSD16 | AC INLET | ⚠(GN) |
| JK702 | SJS702-1 | CONNECTOR(6P) | (GC) |

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads(pF) F=Farads(F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

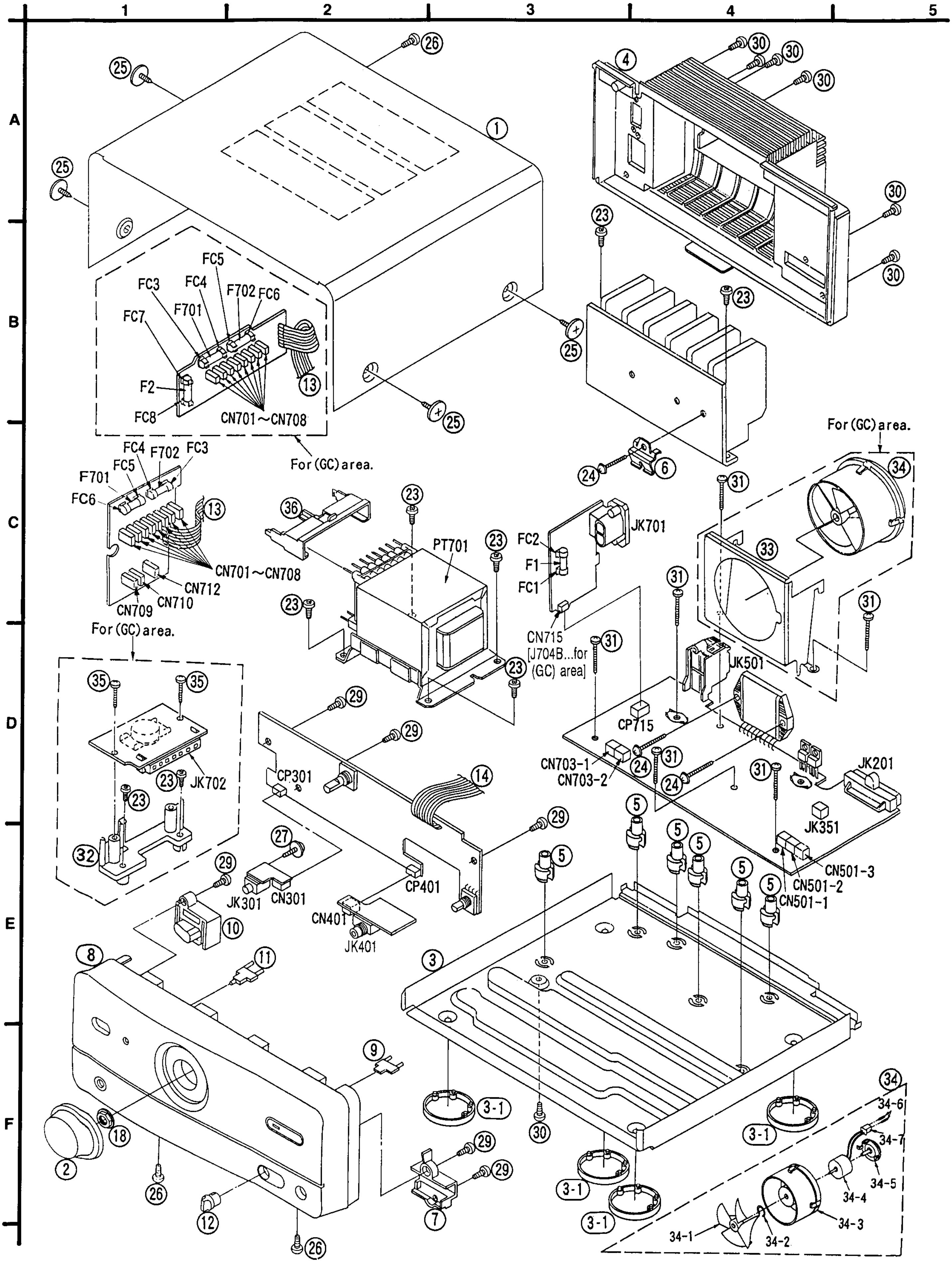
| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| | | RESISTORS |
| R159 | ERDS2TJ100 | 1/4W 10 |
| R217, 218 | ERDS2TJ102 | 1/4W 1K |
| R223, 224 | ERDS2TJ122 | 1/4W 1.2K |
| R251 | ERDS2TJ222 | 1/4W 2.2K |
| R253, 254 | ERDS2EJ121 | 1/4W 120 |
| R255 | ERDS2TJ154 | 1/4W 150K |
| R256 | ERDS2TJ105T | 1/4W 1M |
| R259 | ERDS2TJ561 | 1/4W 560 |
| R291, 292 | ERDS2TJ104 | 1/4W 100K |
| R301, 302 | ERDS2TJ223 | 1/4W 22K |
| R303, 304 | ERDS2TJ333 | 1/4W 33K |
| R305, 306 | ERDS2TJ223 | 1/4W 22K |
| R307, 308 | ERDS2TJ102 | 1/4W 1K |
| R309-312 | ERDS2EJ121 | 1/4W 120 |
| R351 | ERDS2TJ183T | 1/4W 18K (GC) |
| R352 | ERDS2TJ473T | 1/4W 47K (GC) |
| R353 | ERDS2TJ103T | 1/4W 10K (GC) |
| R354 | ERDS2TJ104T | 1/4W 100K (GC) |
| R355 | ERDS2TJ103T | 1/4W 10K (GC) |
| R356 | ERDS2TJ332T | 1/4W 3.3K (GC) |
| R357 | ERDS1FVJ100T | 1/2W 10 ⚠(GC) |
| R358 | ERDS1FVJ220T | 1/2W 22 ⚠(GC) |
| R359 | ERDS2TJ273T | 1/4W 27K (GC) |
| R360 | ERDS2TJ222T | 1/4W 2.2K (GC) |
| R361 | ERDS2TJ474T | 1/4W 470K (GC) |
| R362 | ERDS2TJ102T | 1/4W 1K (GC) |
| R363 | ERDS2TJ103T | 1/4W 10K (GC) |
| R364 | ERDS2TJ103T | 1/4W 10K (GC) |
| R371 | ERDS2TJ273T | 1/4W 27K (GC) |
| R372 | ERDS2TJ273T | 1/4W 27K (GC) |
| R373 | ERDS2TJ222T | 1/4W 2.2K (GC) |
| R374 | ERDS2TJ273T | 1/4W 27K (GC) |
| R375 | ERDS2TJ822 | 1/4W 8.2K |
| R391 | ERDS2TJ473 | 1/4W 47K |
| R401 | ERDS2TJ122 | 1/4W 1.2K |
| R403 | ERDS2TJ473 | 1/4W 47K |
| R404 | ERDS2TJ123 | 1/4W 12K |
| R405 | ERDS2TJ474 | 1/4W 470K |
| R406 | ERDS2TJ102 | 1/4W 1K |
| R407 | ERDS2TJ104 | 1/4W 100K |
| R408 | ERDS2TJ473 | 1/4W 47K |
| R409 | ERDS2TJ332 | 1/4W 3.3K |
| R410 | ERDS2TJ102 | 1/4W 1K |
| R411 | ERDS2TJ562 | 1/4W 5.6K |
| R412 | ERDS2TJ102 | 1/4W 1K |
| R420 | ERDS2TJ104 | 1/4W 100K |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| R501, 502 | ERDS2TJ102 | 1/4W 1K |
| R503-506 | ERDS2TJ563 | 1/4W 56K |
| R507, 508 | ERDS2TJ182 | 1/4W 1.8K |
| R509, 510 | ERDS2TJ102 | 1/4W 1K |
| R511 | ERDS2TJ334 | 1/4W 330K |
| R512 | ERDS2TJ154 | 1/4W 150K |
| R513 | ERDS2TJ684 | 1/4W 680K |
| R514 | ERD25FJ470 | 1/4W 47 ⚠ |
| R515, 516 | ERDS1FVJ100T | 1/2W 10 ⚠ |
| R517, 518 | ERD25FVJ100T | 1/4W 10 ⚠ |
| R571 | ERDS2TJ823T | 1/4W 82K |
| R572 | ERDS2TJ124T | 1/4W 120K |
| R573 | ERDS2TJ563 | 1/4W 56K |
| R574 | ERDS2TJ564 | 1/4W 560K |
| R575 | ERDS2TJ223 | 1/4W 22K |
| R601 | ERDS2TJ331 | 1/4W 330 |
| R602 | ERDS2TJ391 | 1/4W 390 |
| R701, 702 | ERD25FJ2R2 | 1/4W 2.2 ⚠ |
| R703, 704 | ERDS2TJ562 | 1/4W 5.6K |
| R705 | ERDS1FVJ103T | 1/2W 10K ⚠ |
| R709 | ERDS1FVJ221T | 1/2W 220 ⚠ |
| R711 | ERDS1FVJ221T | 1/2W 220 ⚠ |
| R716 | ERDS2TJ392T | 1/4W 3.9K |
| R717 | ERDS2TJ473 | 1/4W 47K |
| R780 | ERDS2TJ822 | 1/4W 8.2K |
| R781, 782 | ERDS2TJ561 | 1/4W 560 |
| | | CAPACITORS |
| C251 | RCE0JKA221BV | 6.3V 220U |
| C301, 302 | ECEA1HKA3R3B | 50V 3.3U |
| C303, 304 | ECBT1H150J5 | 50V 15P |
| C305, 306 | ECBT1H330J5 | 50V 33P |
| C307, 308 | ECEA1CKA220B | 16V 22U |
| C353 | ECEA1HKA2R2B | 50V 2.2U (GC) |
| C361 | ECEA1CKA470B | 16V 47U (GC) |
| C362 | ECEA1CKA100B | 16V 10U (GC) |
| C371 | RCE0JKA221BV | 6.3V 220U (GC) |
| C372 | ECBT1E223ZF5 | 25V 0.022U (GC) |
| C373 | ECBT1H104ZF5 | 50V 0.1U (GC) |
| C381, 382 | ECBT1E103ZF | 25V 0.01U |
| C395, 396 | ECBT1E223ZF | 25V 0.022U |
| C397, 398 | ECBT1E103ZF | 25V 0.01U |
| C401 | ECBT1H221KB5 | 50V 220P |
| C403 | ECEA1HKA3R3B | 50V 3.3U |
| C404 | ECBT1H221KB5 | 50V 220P |
| C405 | ECBT1H101KB5 | 50V 100P |
| C406 | ECEA1CKA100B | 16V 10U |
| C407 | ECEA1HKA3R3B | 50V 3.3U |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| C408 | ECBT1H181KB5 | 50V 180P |
| C409 | ECEA1HKA010B | 50V 1U |
| C410 | ECBT1H221KB5 | 50V 220P |
| C411 | ECBT1E103ZF | 25V 0.01U |
| C412 | ECBT1E223ZF | 25V 0.022U |
| C414 | ECA1AM331B | 10V 330U |
| C415 | ECBT1H102KB5 | 50V 1000P |
| C421 | ECBT1H102KB5 | 50V 1000P |
| C501, 502 | ECA1HAP3R3B | 50V 3.3U |
| C503, 504 | ECBT1H331KB5 | 50V 330P |
| C505, 506 | ECBT1H150J5 | 50V 15P |
| C507, 508 | ECBT1C152KR5 | 16V 1500P |
| C509, 510 | ECEA1HKA3R3B | 50V 3.3U |
| C511, 512 | ECBT1C122KR5 | 16V 1200P |
| C513 | ECA1HM470B | 50V 47U |
| C514 | ECA2AAP100B | 100V 10U |
| C515, 516 | ECBT1H104ZF5 | 50V 0.1U |
| C562 | ECEA1HKN010B | 50V 1U |
| C571 | ECEA0JKA101B | 6.3V 100U |
| C572 | ECBT1E223ZF | 25V 0.022U |
| C599 | ECBT1C103MS5 | 16V 0.01U |
| C701, 702 | ECA1HM222B | 50V 2200U ⚠ |
| C703, 704 | ECEA1CKA330B | 16V 33U |
| C705, 706 | ECBT1H104ZF5 | 50V 0.1U |
| C707 | RCE1HM221BV | 50V 220U ⚠ |
| C710 | ECBT1E103ZF | 25V 0.01U |
| C711 | ECQE1104KF3 | 100V 0.1U |
| C712 | ECBT1E223ZF | 25V 0.022U |
| C714 | ECKR1H103ZF5 | 50V 0.01U |
| C731, 732 | ECKT1H102KB | 50V 1000P |
| C781 | ECEA1CKA100B | 16V 10U |
| C799 | ECBT1H104ZF5 | 50V 0.1U |
| C905, 906 | ECBT1H101KB5 | 50V 100P |
| C1101, 1102 | ECBT1E223ZF | 25V 0.022U |
| C1103-1106 | ECBT1H102KB5 | 50V 1000P |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | CABINET PARTS LIST | |
| | | | |
| 1 | RKM0265A-K | CABINET | |
| 2 | RGW0207-K | KNOB, MAIN VOLUME | |
| 3 | RFKJE1060EK | BOTTOM BOARD ASS'Y | (E, EB, EG, GN) |
| 3 | RFKJE1060GCK | BOTTOM BOARD ASS'Y | (GC) |
| 3-1 | RKA0011-3 | FOOT | |
| 4 | RFKHECH510EB | REAR PANEL ASS'Y | (EB, GN) |
| 4 | RFKHECH510EG | REAR PANEL ASS'Y | (EG) |
| 4 | RFKHECH510GC | REAR PANEL ASS'Y | (GC) |
| 4 | RKF0376C-K | REAR GRILL ASS'Y | (E) |
| 5 | RKQ0089 | P. C. B. SPACER | |
| 6 | RMC0158 | TRANSISTOR HOLDER | |
| 7 | RMN0277 | HOLDER | |
| 8 | RFKGECH510EK | FRONT PANEL ASS'Y | |
| 9 | RFKNECH510EA | PANEL LIGHT A | |
| 10 | RGU1077-K | BUTTON, POWER | |
| 11 | RFKNECH510EB | PANEL LIGHT B | |
| 12 | RGW0178-1K | KNOB, MIC VOLUME | |
| 13 | RWJ1808130XX | FLAT CABLE (8P) (W703) | (E, EB, EG, GN) |
| 13 | RWJ1808100XX | FLAT CABLE (8P) (J703) | (GC) |
| 14 | RWJ1812220QC | FLAT CABLE (12P) (W501) | |
| 18 | RHN90001 | NUT | |
| 23 | XTB3+8JFZ | SCREW | |
| 24 | XTW3+15T | SCREW | |
| 25 | RHD30007 | SCREW | |
| 26 | XTBS3+8JFZ1 | SCREW | |
| 27 | RHD26016 | SCREW | |
| 29 | XTBS26+10J | SCREW | |
| 30 | XTB3+10JFZ | SCREW | |
| 31 | XTB3+20JFZ | SCREW | |
| 32 | RMN0190 | HOLDER | (GC) |
| 33 | RMN0282 | FAN ANGLE | (GC) |
| 34 | SYE1128-4 | FAN | (GC) |
| 34-1 | SHE232 | FAN | (GC) |
| 34-2 | SUS271 | SPRING | (GC) |
| 34-3 | SHE233-1 | FAN CASE | (GC) |
| 34-4 | MDN-4RB4MRC | MOTOR | (GC) |
| 34-5 | SHE234 | CAP | (GC) |
| 34-6 | SJT783 | TERMINAL | (GC) |
| 34-7 | SJS5215 | CONNECTOR (2P) | (GC) |
| 35 | XTB3+12JFZ | SCREW | (GC) |
| 36 | RMN0191 | HOLDER | |
| | | | |
| | | PACKING MATERIALS | |
| | | | |
| P1 | RPG2146 | PACKING CASE (SYSTEM) | (E, EG) |
| P1 | RPG2147 | PACKING CASE (SYSTEM) | (EB) |
| P1 | RPG2148 | PACKING CASE (SYSTEM) | (GC) |
| P1 | RPG2150 | PACKING CASE (SYSTEM) | (GN) |
| P2 | RPG2231 | PACKING CASE (DECK) | |
| P3 | RPG2232 | PACKING CASE (CD-TUNER) | |
| P4 | RPG2230 | PACKING CASE (AMPLIFIER) | |
| P5 | RPN0815 | PAD (DECK) | |
| P6 | RPN0816 | PAD (CD-TUNER) | |
| P7 | RPN0817 | PAD (AMPLIFIER) | |
| P8 | SPP740 | PROTECTION COVER | |
| P9 | RPQF0047 | ACCESSORIES BOX | |
| P10 | RPQ0458 | SPACER | |
| P11 | XZB25X34C03Y | PROTECTION COVER | |
| | | | |
| | | ACCESSORIES | |
| | | | |
| A1 | RAK-CH144WH | REMOTE CONTROL TRANSMITTER | |
| A1-1 | RKK0057-K | BATTERY COVER | |
| A2 | REE0499 | SPEAKER CORD | |
| A3 | REX0511 | FLAT CABLE (LONG TYPE) | |
| A4 | REX0608 | FLAT CABLE (SHORT TYPE) | |
| A5 | RJA0019-2A | AC POWER SUPPLY CORD | ⚠ (E, EG, GC) (SF) |
| A5 | VJA0733 | AC POWER SUPPLY CORD | ⚠ (EB) (SF) |
| A5 | RJA0036-K | AC POWER SUPPLY CORD | ⚠ (GN) |
| A6 | RFKSECH510EK | INSTRUCTION MANUAL | (E) |
| A6 | RFKSECH510EB | INSTRUCTION MANUAL | (EB) |
| A6 | RQT2591-E | INSTRUCTION MANUAL | (EG) |
| A6 | RQT2590-G | INSTRUCTION MANUAL | (GC) |
| A6 | RQT2589-B | INSTRUCTION MANUAL | (GN) |
| A7 | RQX74332A | WARRANTY CARD | (GN) |
| A7 | RQA0013 | WARRANTY CARD | (E, EB, EG) |
| A8 | RQCB0169 | SERVICE CENTER LIST | |
| A9 | RSA0007 | FM INDOOR ANTENNA | |
| A10 | RSA0012 | AM LOOP ANTENNA | |
| A10-1 | RMN0244 | ANTENNA HOLDER | |
| A10-2 | XTN2+12AFZ | SCREW | |
| A11 | SJP9009 | ATTACHMENT PLUG | (EB) |
| A12 | SJP5213-2 | POWER PLUG ADAPTOR | (GC) |
| A13 | RFE0014 | ANTENNA PLUG | (GC, GN) |

# ■ Cabinet Parts Location


1
2
3
4
5
A
B
C
D
E
F
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
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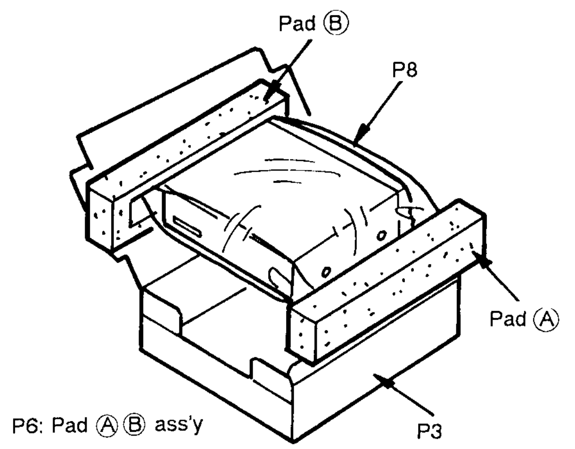
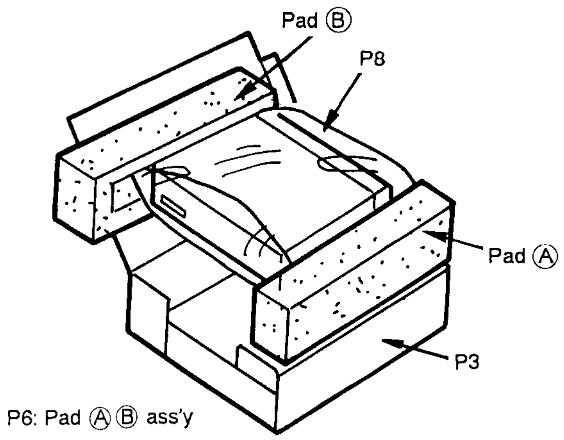
㉛
㉜
㉝
㉞
㉟
㊱
3-1
34-1
34-2
34-3
34-4
34-5
34-6
34-7
FC3
FC4
FC5
FC6
FC7
FC8
F701
F702
F2
CN701～CN708
For (GC) area.
CN709
CN710
CN712
PT701
FC2
F1
FC1
JK701
CN715
[J704B...for (GC) area]
CP715
JK501
CN703-1
CN703-2
JK201
JK351
CN501-1
CN501-2
CN501-3
JK702
CP301
JK301
CN301
CP401
CN401
JK401

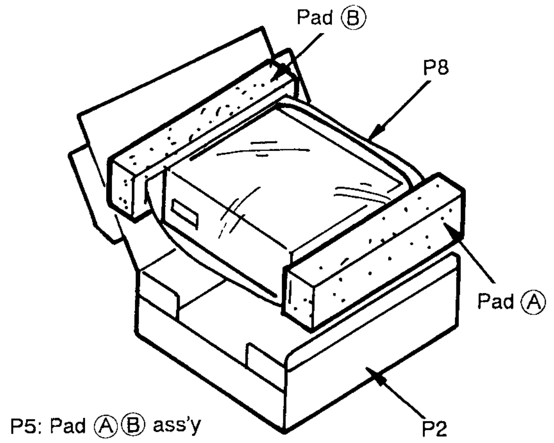
## ■ Packaging


Pad Ⓑ
P8
Pad Ⓐ
P6: Pad Ⓐ Ⓑ ass'y
P3

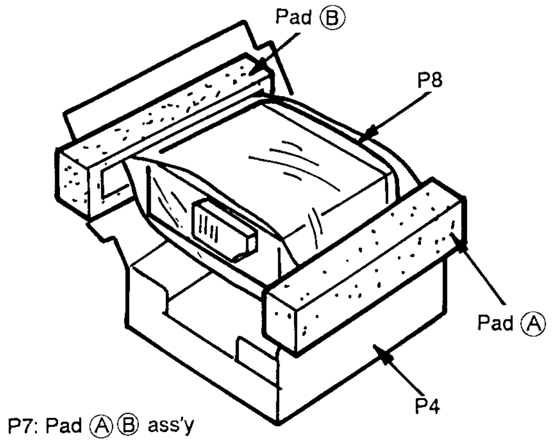
(SL-CH510: Compact disc player)


Pad Ⓑ
P8
Pad Ⓐ
P3
P6: Pad Ⓐ Ⓑ ass'y

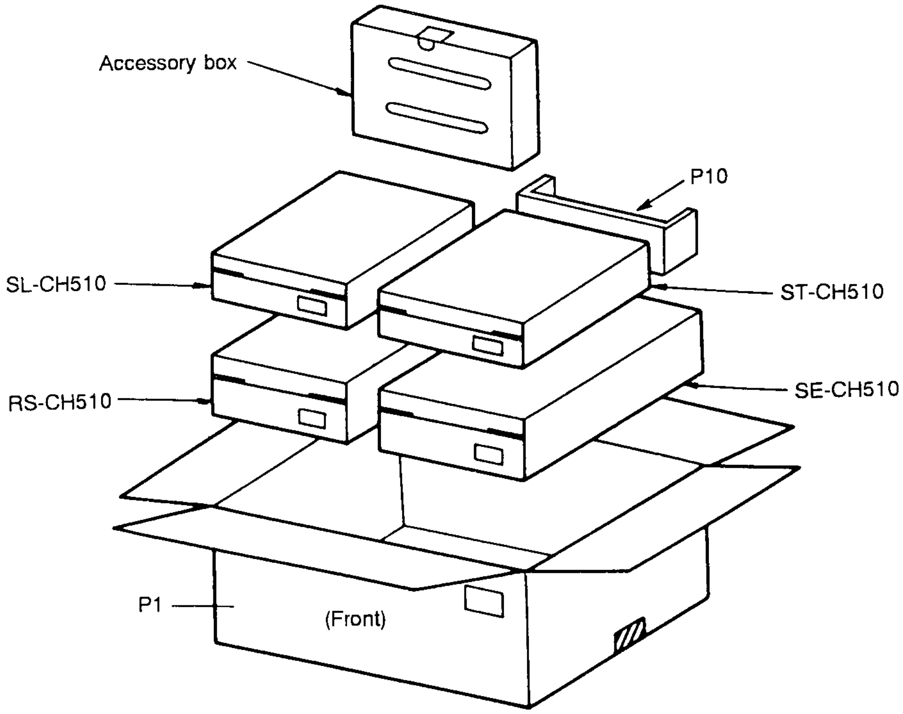
(ST-CH510: Tuner/sound processor)

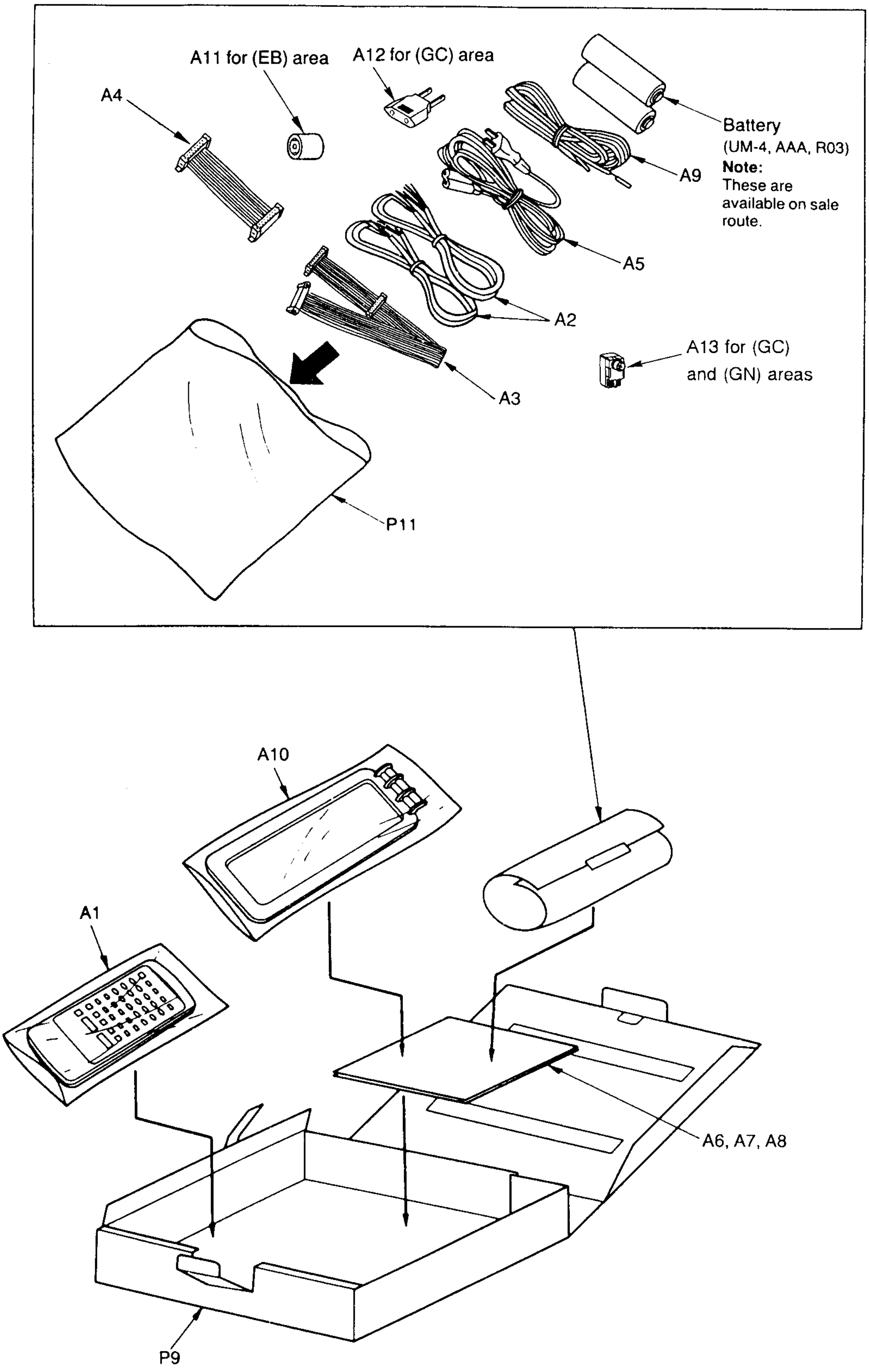

Pad Ⓑ
P8
Pad Ⓐ
P5: Pad Ⓐ Ⓑ ass'y
P2

(RS-CH510: Cassette deck)


Pad Ⓑ
P8
Pad Ⓐ
P4
P7: Pad Ⓐ Ⓑ ass'y

(SE-CH510: Amplifier)


Accessory box
P10
SL-CH510
ST-CH510
RS-CH510
SE-CH510
P1
(Front)


A11 for (EB) area
A12 for (GC) area
A4
Battery
(UM-4, AAA, R03)
Note:
These are available on sale route.
A9
A5
A2
A13 for (GC) and (GN) areas
A3
P11
A10
A1
A6, A7, A8
P9

ORDER NO. AD9407191C8

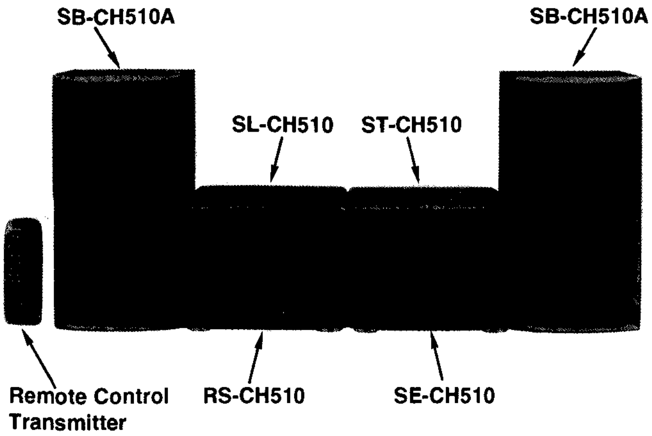
# Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

MASH*1
multi-stage noise shaping

## Compact Disc Player
# SL-CH510



**Colour**

(K) ................ Black Type

**Area**

| Suffix for Model No. | Area | Colour |
|---|---|---|
| (E) | Europe, Asia, Latin America, Middle Near East and Africa and Oceania | (K) |

**Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.**

**System: SC-CH510**

## RAE0113Z MECHANISM SERIES

## Specifications

### ■ Audio

| | |
|---|---|
| **DA converter** | 1 bit 2 DAC MASH |

### ■ Pickup

| | |
|---|---|
| **Wavelength** | 780 nm |

### ■ General

| | |
|---|---|
| **Dimensions (W × H × D)** | 270 × 89 × 266 mm |
| **Weight** | 1.9 kg |

**Notes:**
Specifications are subject to change without notice.
Weight and dimensions are approximate.

*1
MASH is a trademark of NTT.

| System | Tuner/sound processor | Compact disc player | Amplifier | Cassette Deck | Speakers |
|---|---|---|---|---|---|
| **SC-CH510** | ST-CH510 | **SL-CH510** | SE-CH510 | RS-CH510 | *2 SB-CH510A |

*2: For Europe .................. Made in PAES
For other areas ............ Made in NABEL

Technics®

# ■ Contents

Page
- Handling Precautions for Traverse Deck .......... 2
- Precaution of Laser Diode .......... 2, 3
- Location of Controls .......... 3
- Listening to Compact Discs .......... 4
- Operation Check and Main Component Replacement Procedures .......... 5~8
- Measurements and Adjustments .......... 9, 10
- Schematic Diagram .......... 11~16
- Printed Circuit Board Diagram .......... 17~19
- Wiring Connection Diagram .......... 20

Page
- Block Diagram .......... 21~24
- About the Self-Diagnostic Mode .......... 25
- Automatic Adjustment Results Display Function .......... 26
- Troubleshooting Guide .......... 27, 28
- Function of IC Terminals .......... 29~32
- Replacement Parts List .......... 33~36
- Cabinet Parts Location .......... 37
- Loadiong Unit Parts Location .......... 38

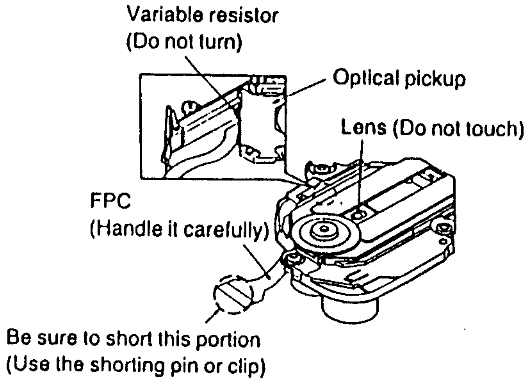
**NOTE:**
**Refer to the service manual for Model No. SE-CH510 (ORDER No. AD9407197C8) for information on "Accessories", "Stacking the Components", "Connections" and "Packaging".**

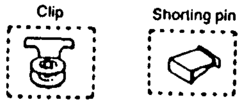
# ■ Handing Precautions for Traverse Deck

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

### • Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board (FPC board). When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

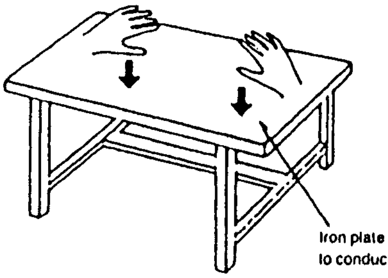


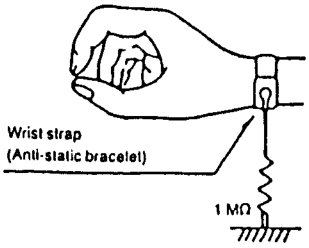


### • Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conducive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.

**Caution:**
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).


Iron plate or some metals
to conduct electricity



# ■ Precaution of Laser Diode

**CAUTION:** This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.
Wave length: 780 nm
Maximum output radiation power from pick up: 100 μW/VDE

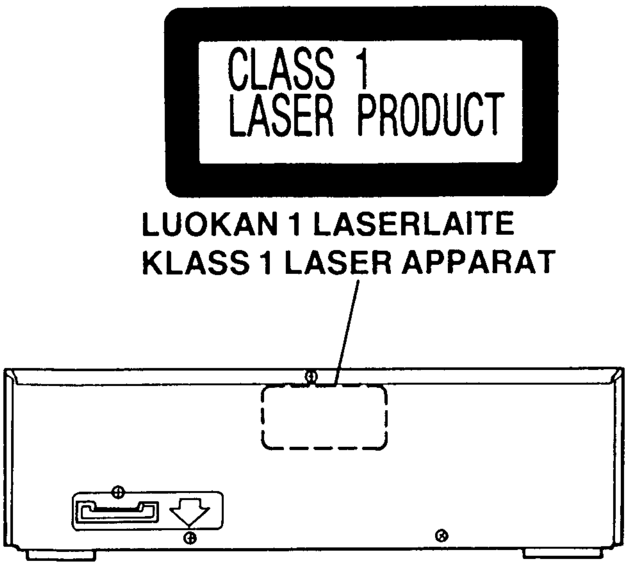
Laser radiation from the pick up unit is safety level, but be sure the followings:

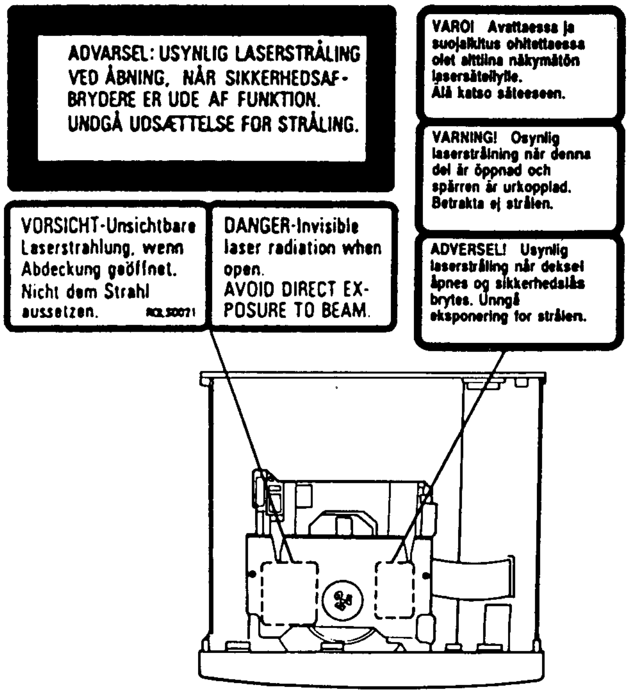
1. Do not disassemble the pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick up unit. It was already adjusted.
3. Do not lock at the focus lens using optical instruments.
4. Recommend not to lock at pick up lens for a long time.

**ACHTUNG:** Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit adgestrahlt.
Wellenlänge: 780 nm
Maximale strahlungsleistung der laserinheit: 100 µW/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

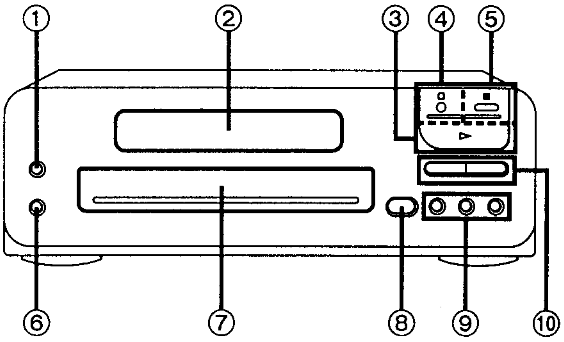
1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinreit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.


CLASS 1
LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT


ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT-Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet. Nicht dem Strahl aussetzen.
DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
VARO! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymätön lasersäteilylle. Älä katso säteeseen.
VARNING! Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.
ADVERSEL! Usynlig laserstråling når deksel åpnes og sikkerhedslås brytes. Unngå eksponering for strålen.

## ■ Location of Controls

- ① **Repeat button**
- ② **Display section**
- ③ **Play button and indicator**
- ④ **Stop button**
- ⑤ **Pause button**
- ⑥ **Random play button**
- ⑦ **Disc tray**
- ⑧ **Disc tray open/close button**
- ⑨ **CD edit button**
- ⑩ **Skip/search buttons**


①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩

# ■ Listening to Compact Discs

## *Sequential play*

*1* **Switch on the power.**
"no dISC" indicates that a CD has not been installed.

*2* **Press ▲ OPEN/CLOSE to open the tray.**
**Insert the CD with label facing upward.**
Do not put your finger through the hole in the middle of the tray. It could get caught when the tray closes.
An adaptor for CD single is not required.

*3* **Press ▲ OPEN/CLOSE to close the tray.**
When there are 13 or more tracks on the CD, "⪢" will appear.

*4* **Press ▷.**
Press the button on the "▷" indicator to start play correctly.
Play will start from the first track on the CD.
Play will stop automatically when the last track on the CD finishes playing.

*5* **Adjust the volume level as you like.**

---

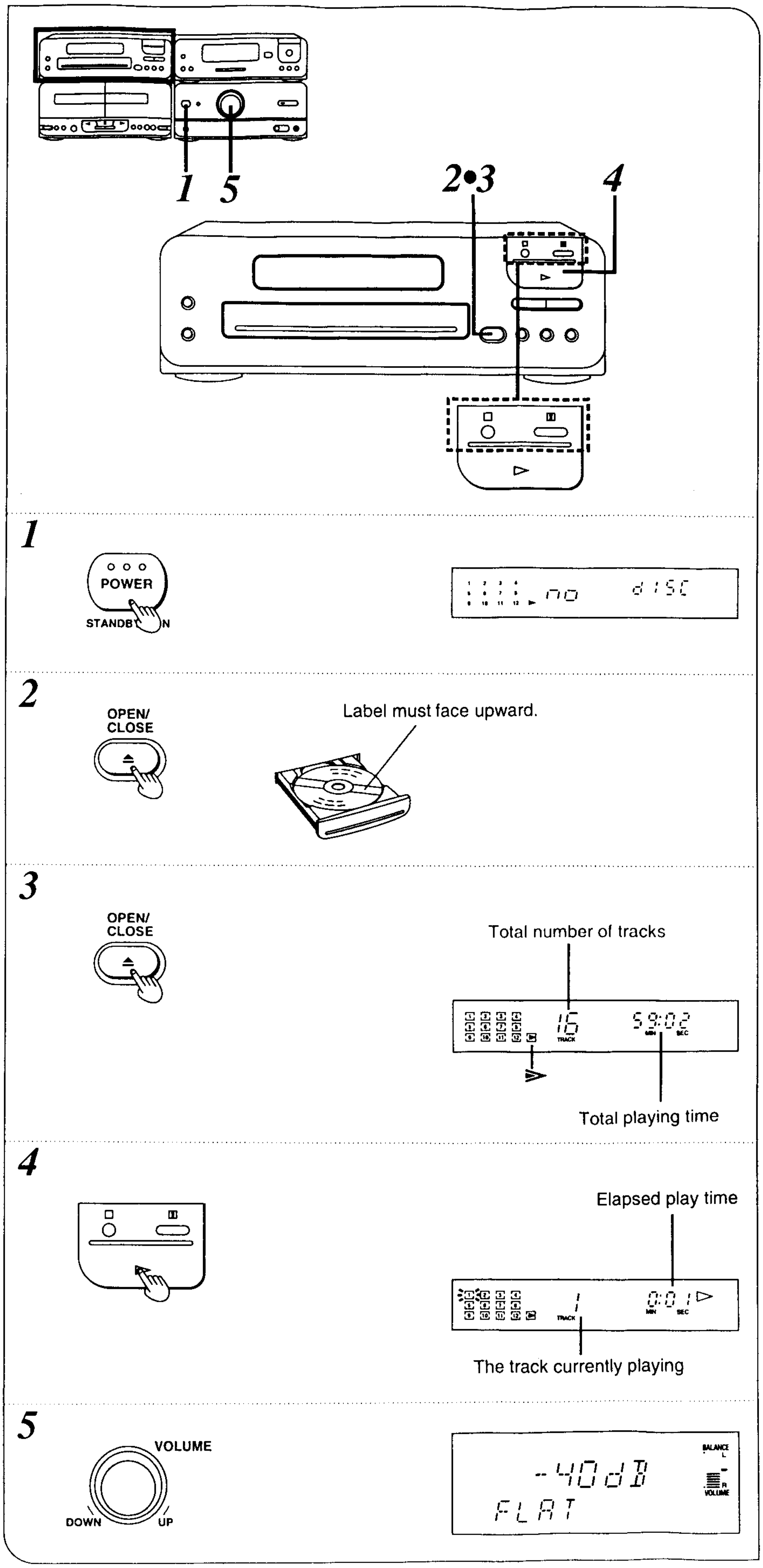
**To stop the disc play:**
Press □.

**To temporarily stop the disc play:**
Press ▯▯. ▷ flashes up green.
To play again, press ▷.

**For your reference:**
If you press ▷ instead of ▲ OPEN/CLOSE after inserting a CD, the tray will close and play will start directly from the track 1.

**About ▷ indicator:**
While halted: Lights up orange.
While playing: Lights up green.

**About the total playing time:**
The total playing time displayed includes the silent sections between tracks. Hence, there will be a difference between the total playing time and the liner notes.


1
5
2•3
4
1
POWER
STANDBY ON
no dISC
2
OPEN/CLOSE
Label must face upward.
3
OPEN/CLOSE
Total number of tracks
15
TRACK
59:02
MIN SEC
Total playing time
4
Elapsed play time
1
0:01
TRACK
MIN SEC
The track currently playing
5
VOLUME
DOWN
UP
-40dB
FLAT
BALANCE
VOLUME

# ■ Operation Check and Main Component Replacement Procedures

**NOTE**

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Illustrated screws are equivalent to actual size.
5. Refer the parts No. on the page of “Main Component Replacement Procedures”, if necessary.

## ● Contents

Page

- **Checking Procedure for each P.C.B.**

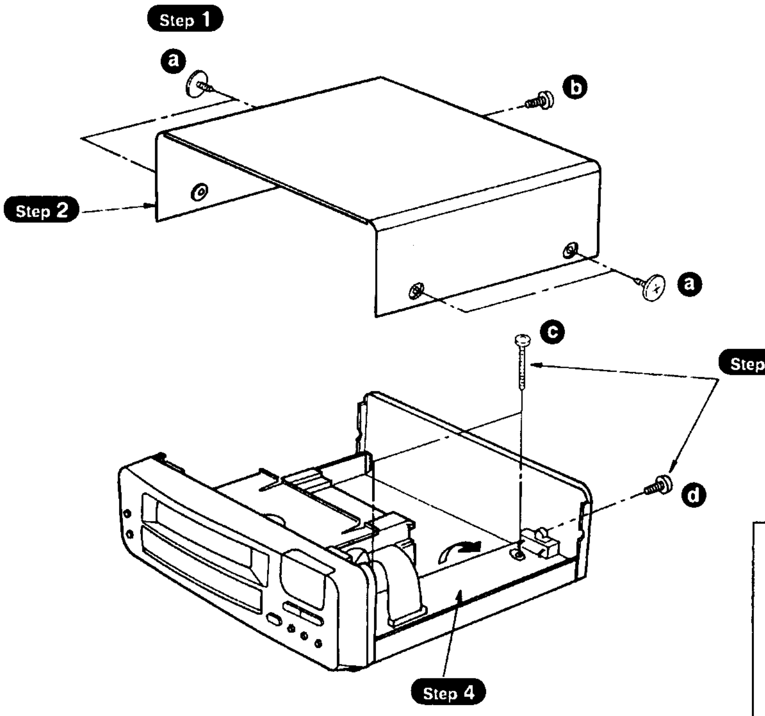
1. Checking for the main P.C.B. ........ 5.
2. Checking for the operation P.C.B. and servo P.C.B. ........ 6.

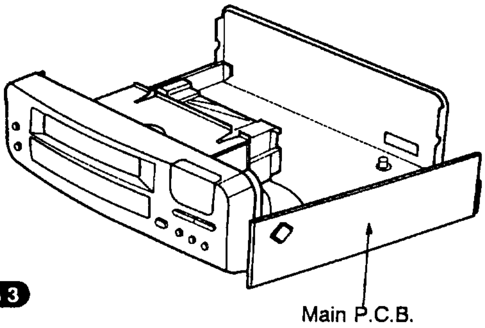
- **Main Component Replacement Procedures**

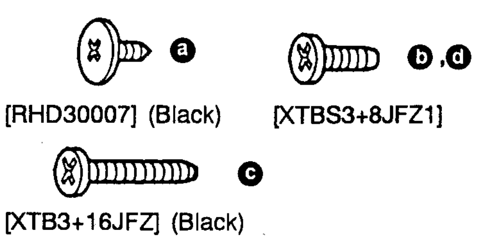
1. Replacement for the traverse deck ass'y ........ 6~8.
2. Replacement for the loading belt and loading motor ........ 8.

# ■ Checking Procedure for each P.C.B.

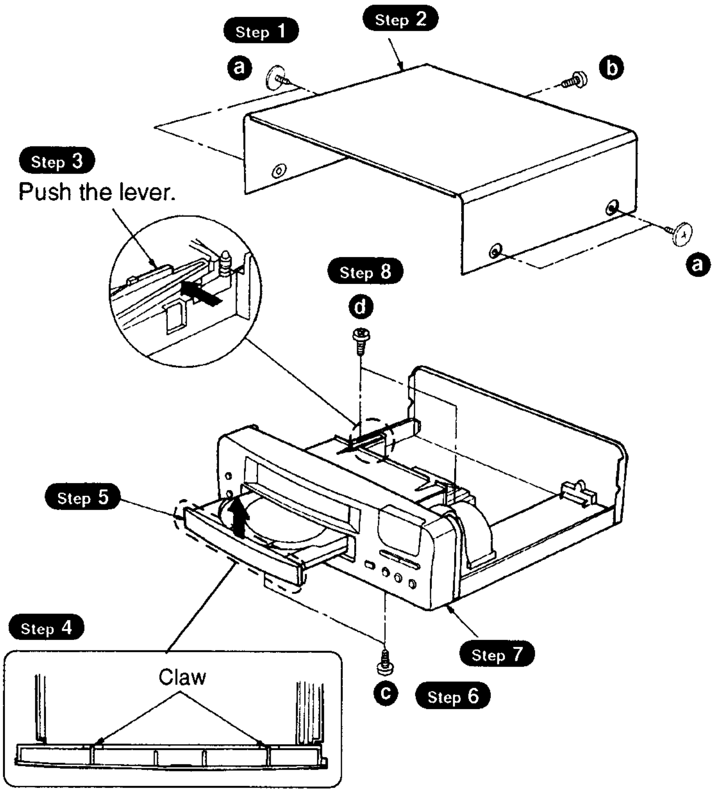
## 1. Checking for the main P.C.B.

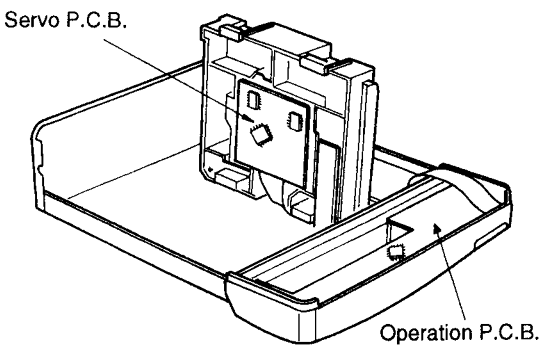


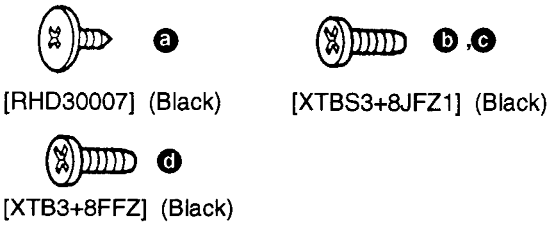




## 2. Checking for the operation P.C.B. and the servo P.C.B.


Step 1
Step 2
a
b
a
Step 3
Push the lever.
Step 8
d
Step 5
Step 4
Claw
Step 7
c
Step 6

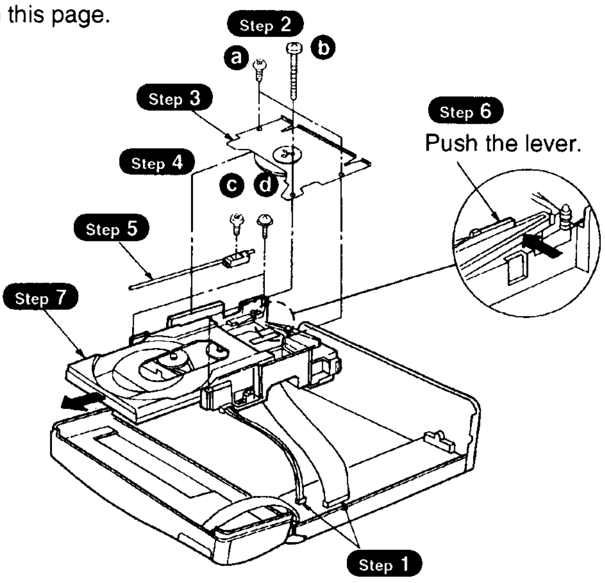

Servo P.C.B.
Operation P.C.B.

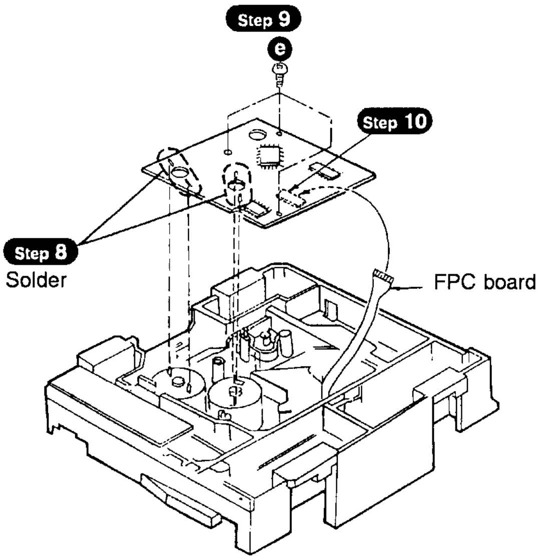

a
[RHD30007] (Black)
b,c
[XTBS3+8JFZ1] (Black)
d
[XTB3+8FFZ] (Black)

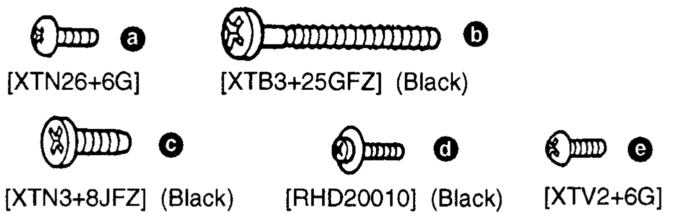
## ■ Main Component Replacement Procedures

### 1. Replacement for the traverse deck ass'y

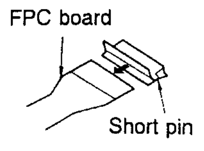
- Follow the item 2 in checking procedure for each P.C.B. on this page.

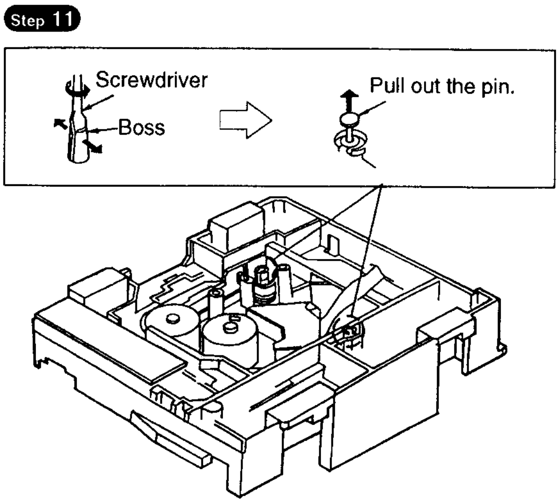

Step 2
a
b
Step 3
Step 4
c
d
Step 5
Step 7
Step 6
Push the lever.
Step 1

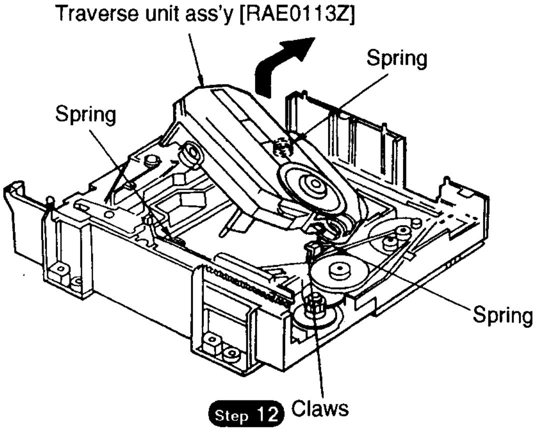

Step 9
e
Step 10
Step 8
Solder
FPC board


a
[XTN26+6G]
b
[XTB3+25GFZ] (Black)
c
[XTN3+8JFZ] (Black)
d
[RHD20010] (Black)
e
[XTV2+6G]

**Caution:**
Insert a short pin into the traverse unit FPC board.
(Refer to "Handling Precautions for Traverse Deck" on page 2.)


FPC board
Short pin

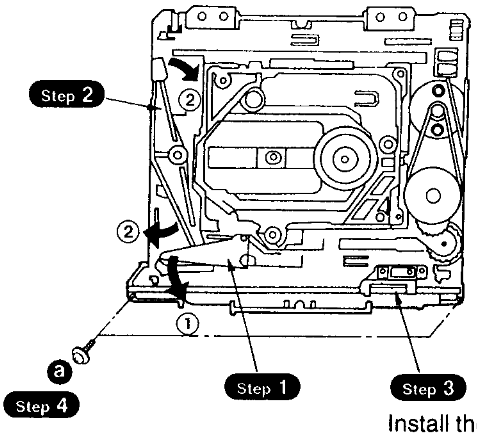

Step 11
Screwdriver
Boss
Pull out the pin.


Traverse unit ass'y [RAE0113Z]
Spring
Spring
Spring
Step 12
Claws

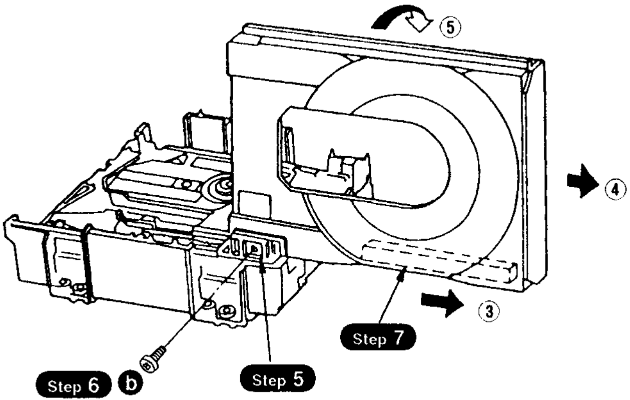
**NOTE**

Be careful not to lose the 3 springs because those will also be removed on removal of the traverse unit ass'y.

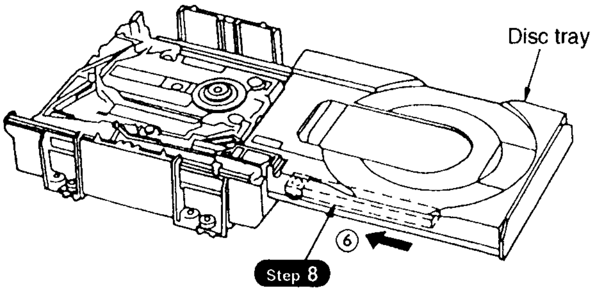
## Installation of the disc tray after replacement


Step 2
②
②
①
ⓐ
Step 4
Step 1
Step 3

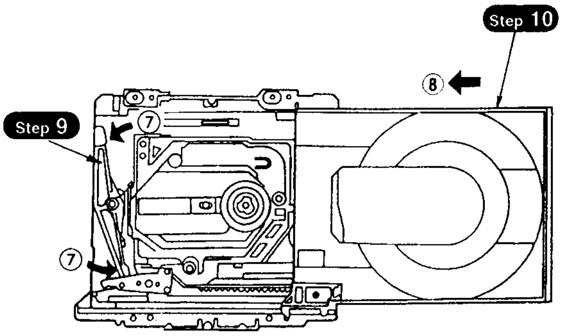
Install the guide shaft and guide shaft holder.


⑤
④
③
Step 7
Step 6
ⓑ
Step 5

Install the disc tray.


Disc tray
⑥
Step 8

Hold the disc tray and slide the drive gear (2).


Step 10
⑧
Step 9
⑦
⑦

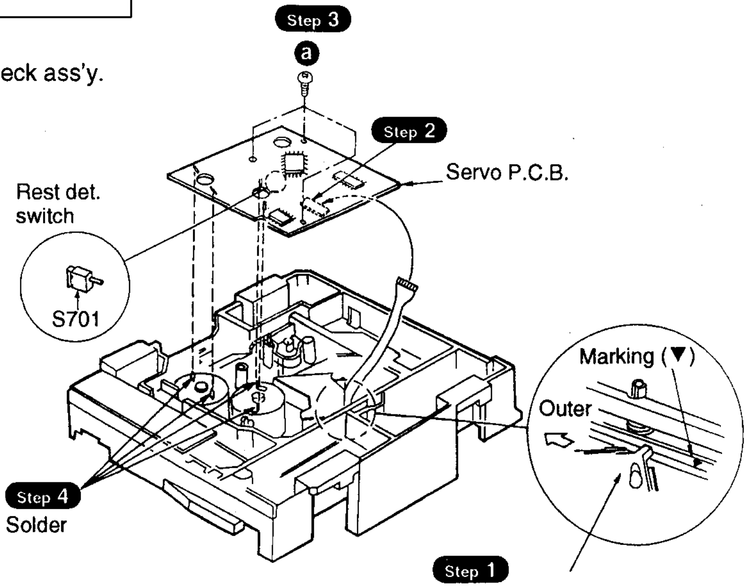
ⓐ [RHD20010] (Black)

ⓑ [XTN3+8JFZ] (Black)

## Installation of the servo P.C.B. after replacement

**Step 1** Install the servo P.C.B. in the traverse deck ass'y.

Before installing the servo P.C.B., move the optical pickup toward the outer edge from the mark "▼". [Otherwise, the rest detect switch (S701) mounted on the servo P.C.B. may be damaged.]

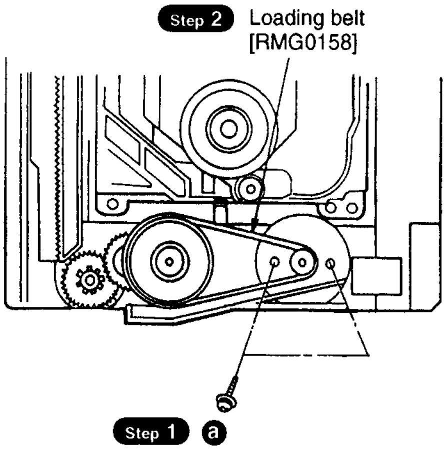

Step 3
a
Step 2
Servo P.C.B.
Rest det. switch
S701
Marking (▼)
Outer
Step 4
Solder

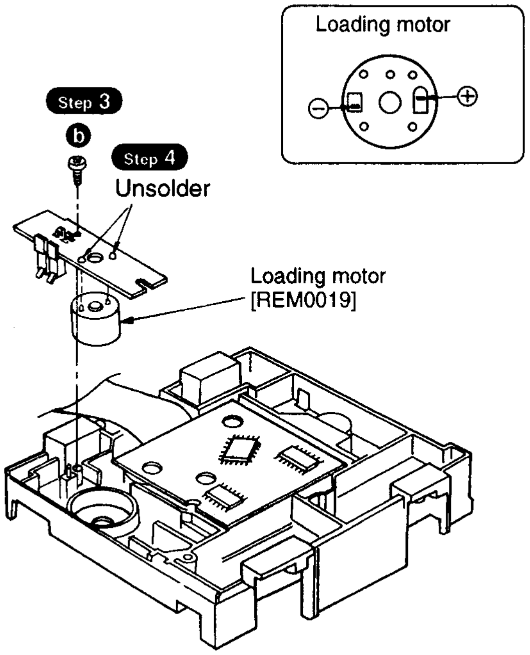
**Step 1** Install the optical pickup toward the outer edge from the mark "▼".

[XTV2+6G]

## 2. Replace for the loading belt and loading motor

- Follow the item 2 in checking procedure for each P.C.B. on page 6.
- Follow the **Step 1** ~ **Step 7** of item 1 in main component replacement procedures on page 6.


Step 2
Loading belt
[RMG0158]
Step 1
a


Loading motor
⊖
⊕
Step 3
b
Step 4
Unsolder
Loading motor
[REM0019]

[XYN2+F6FZ]

[XTN26+6G]

## ■ Measurements and Adjustments

**Cautions:**
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

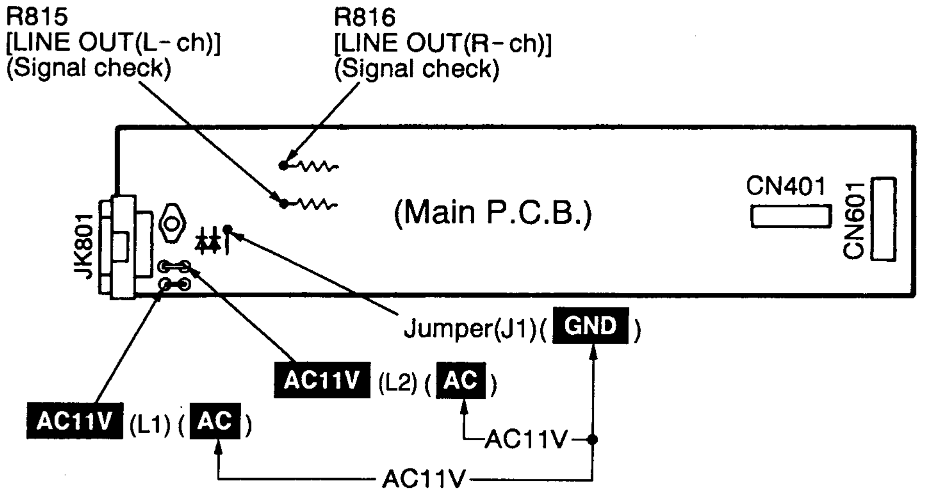
This unit SL-CH510 is designed to operate on power supplied from the Amplifier SE-CH510 through the Tuner/Sound Processor ST-CH510.
When connecting the unit to other system components, do not connect to the Amplifier SE-CH510 directly. Be sure to connect this unit through the Tuner/Sound Processor ST-CH510.
When operating the unit SL-CH510 alone for testing and servicing, without having power supplied from the Amplifier SE-CH510 and the Tuner/Sound Processor ST-CH510, use the following method.

### Power Supply to This Unit alone

Apply 11V AC power to the section between **AC11V** ( **AC** ) of the coil (L1) and the jumper J1 ( **GND** ) as well as the section between **AC11V** ( **AC** ) of the coil (L2) and the jumper J1 ( **GND** ). (10V AC power can be also applied when using power supply tool.) **(Shown in Fig. 1)**

### To Check Signals

Connect the oscilloscope or the speaker with built-in amplifier to the section between LINE OUT (Lch) of the resistor R815 and the GND point of the jumper J1 as well as the section between LINE OUT (Rch) of the resistor R816 and the GND point of the jumper J1 and check if the signals are outputting from this unit. **(Shown in Fig. 1)**



(Apply 10 V AC power when using power supply tool.)

**Fig. 1**

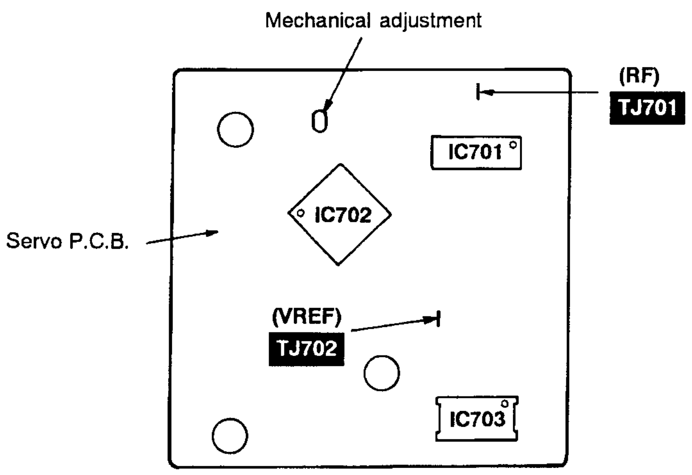
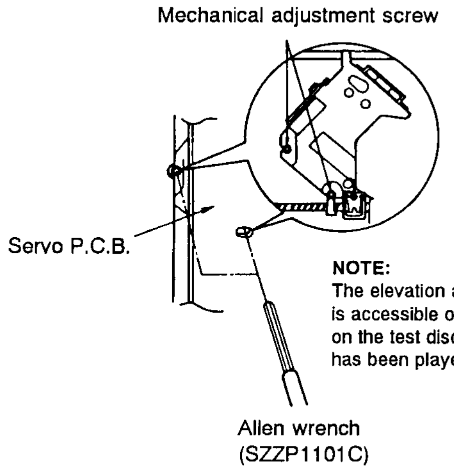


**Fig. 2**



NOTE:
The elevation angle adjusting pot is accessible only after track 19 on the test disc, SZZP1056C, has been played.

**Fig. 3**

### ● Preparation of Adjustment

1. Insert test disc into the unit.
2. Turn the power of this unit off and then turn it on. (The CD unit is adjusted automatically with it stood.)

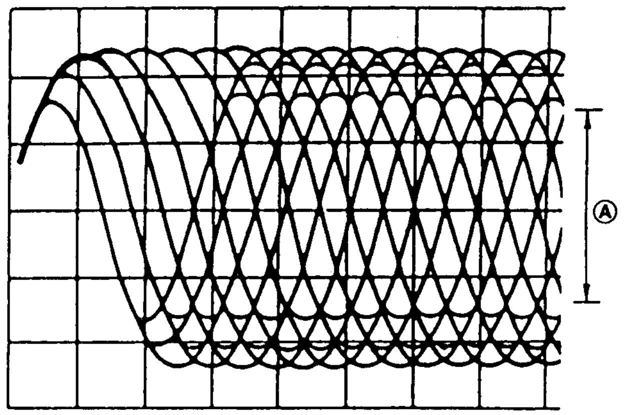
### Measuring Instruments and Special Tools

- Test disc
  1. Playability test disc (SZZP1054C)
  2. Uneven test disc (SZZP1056C)
- Allen wrench (M2.0) (SZZP1101C)
- Oscilloscope

**(1) MECHANICAL ADJUSTMENT**

- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability when the traverse deck has not been replaced. Make the electrical adjustments first.

1. Connect the oscilloscope's CH. 1 probe across **TJ701** (+) and **TJ702** (VREF) on the Servo P.C.B. (Shown in Fig. 2)
   Oscilloscope setting:
   VOLT .................................................. 200 mV
   SWEEP .............................................. 0.5 μsec
   Input coupling ............................................ AC
2. Switch the player power **ON**, and play track **19** on the test disc (SZZP1056C).
3. Leave the player in Play mode and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0 mm allen wrench (SZZP1101C) unit the RF signal amplitude on the oscilloscope is maximize. (Shown in Fig. 3)
5. After completing the adjustment, lock the mechanical adjustments with lock paint (RZZ0L01).

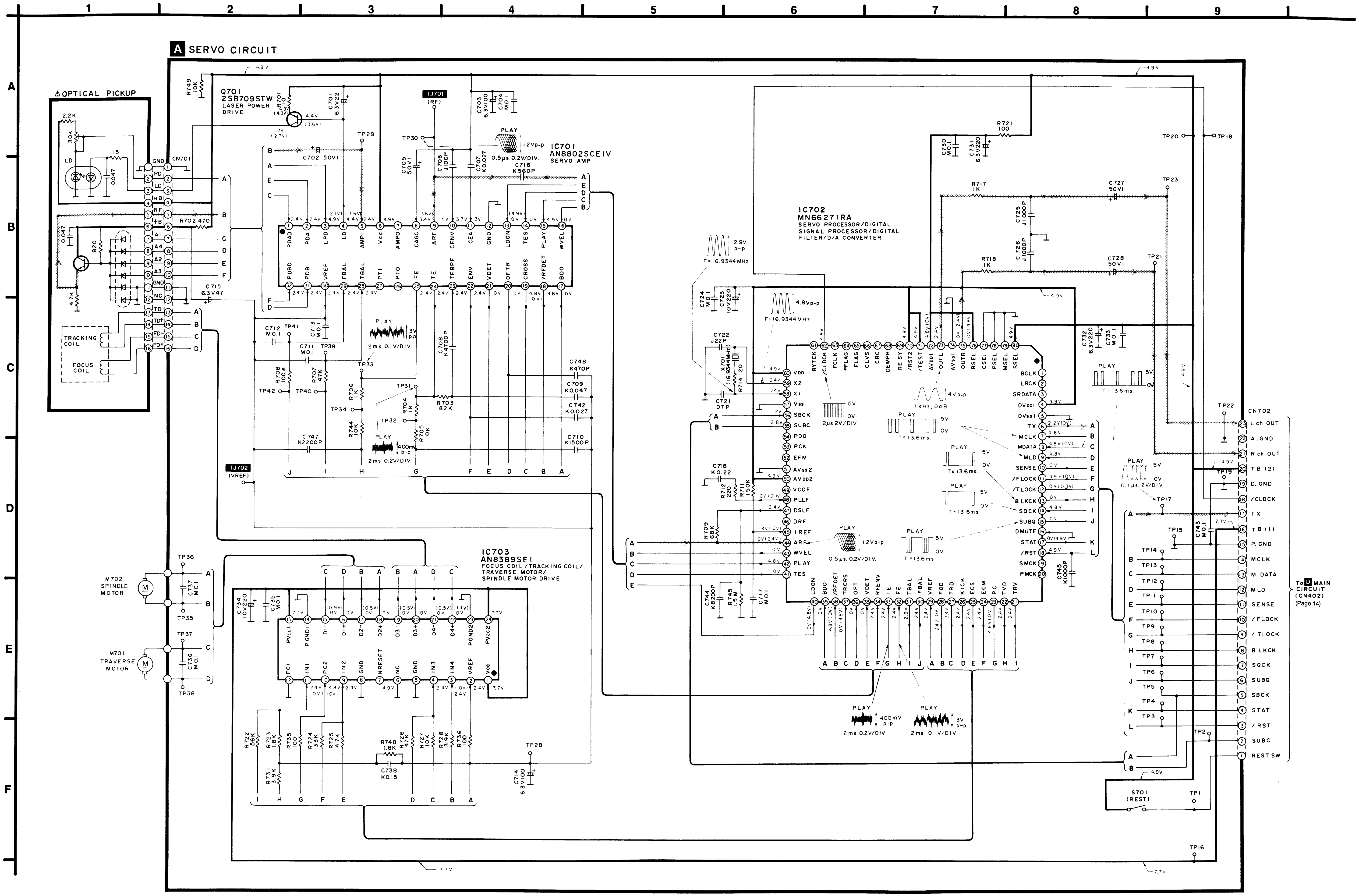


**Ⓐ Maximize the amplitude.**

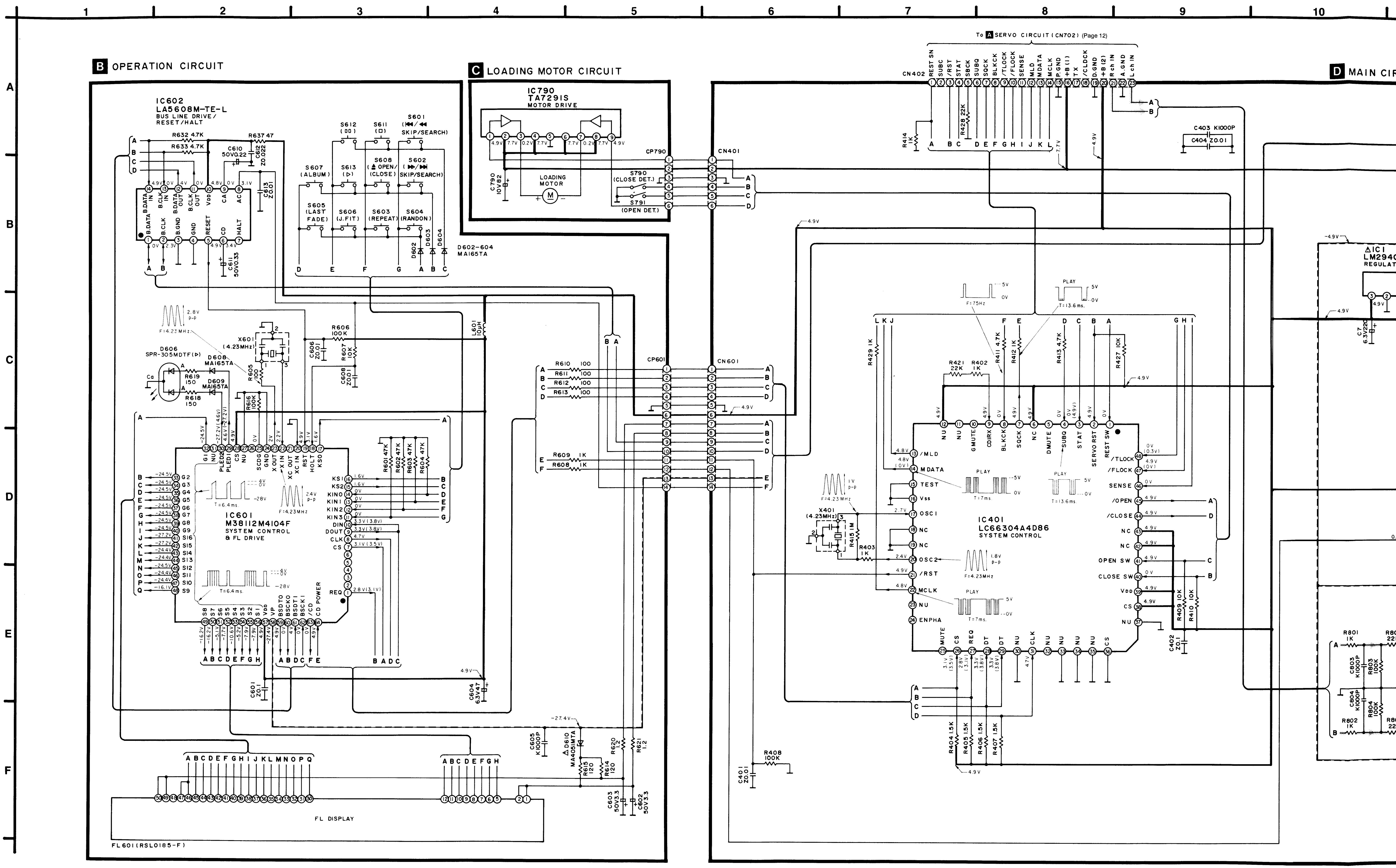
**(2) CHECK OF PLAY OPERATION AFTER ADJUSTMENT**

- Checking Skip Search
  1. Play an ordinary musical program disc.
  2. Press the skip button to check for normal skip search operation (in both the forward and reverse direction).
- Checking Manual Search
  1. Play an ordinary musical program disc.
  2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).
- Checking playability
  1. Play the 0.7 mm black dot and the 0.7 mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
  2. Play the middle tracks of the uneven test disc and verify that no sound skip or noise occurs.

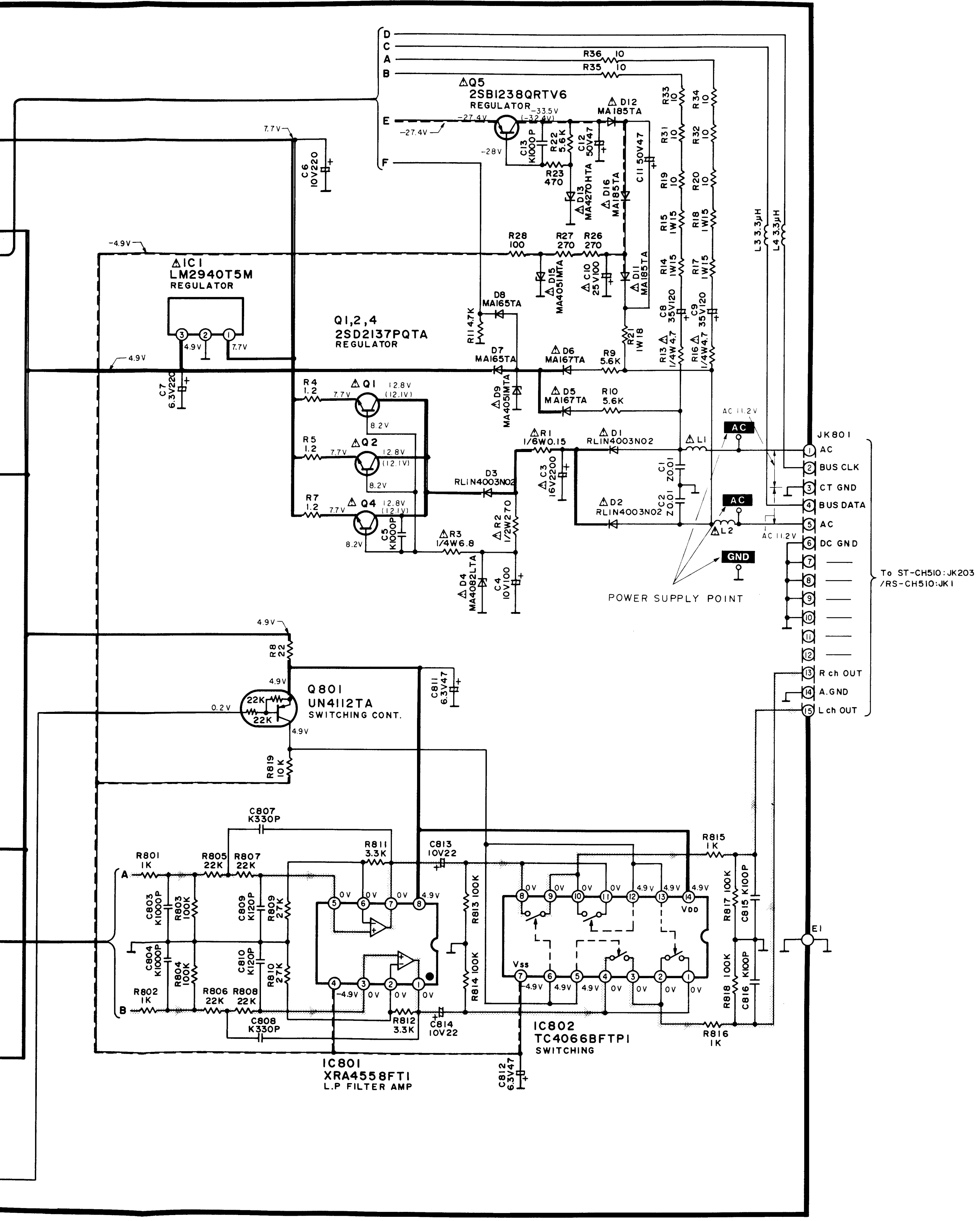
## ■ Schematic Diagram ● Optical Pickup/Servo circuit (Parts list on Pages 33~35)


A SERVO CIRCUIT
△OPTICAL PICKUP
CN701
Q701 2SB709STW LASER POWER DRIVE
TJ701 (RF)
TJ702 (VREF)
IC701 AN8802SCEIV SERVO AMP
IC702 MN66271RA SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/DIGITAL FILTER/D/A CONVERTER
IC703 AN8389SEI FOCUS COIL/TRACKING COIL/TRAVERSE MOTOR/SPINDLE MOTOR DRIVE
TRACKING COIL
FOCUS COIL
M702 SPINDLE MOTOR
M701 TRAVERSE MOTOR
S701 (REST)
CN702
To D MAIN CIRCUIT (CN402) (Page 14)
L ch OUT
A. GND
R ch OUT
+B (2)
D. GND
/CLDCK
TX
+B (1)
P. GND
MCLK
M DATA
MLD
SENSE
/FLOCK
/TLOCK
B LKCK
SQCK
SUBQ
SBCK
STAT
/RST
SUBC
REST SW
F=16.9344MHz
PLAY
2ms. 0.1V/DIV.
2ms. 0.2V/DIV.
0.5μs. 0.2V/DIV.
T=13.6ms.
1kHz, 0dB
4.9V
7.7V

## ● Loading Motor/ Operation/ Main circuit (Parts list on Pages 33～35)


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
B OPERATION CIRCUIT
C LOADING MOTOR CIRCUIT
D MAIN CIR
To A SERVO CIRCUIT (CN702) (Page 12)
IC602
LA5608M-TE-L
BUS LINE DRIVE/ RESET/HALT
R632 4.7K
R633 4.7K
R637 47
C610 50V0.22
C612 Z0.022
C613 Z0.01
C611 50V0.33
B.DATA IN
B.CLK IN
B.DATA OUT
B.CLK OUT
VDD
CA
AC
B.DATA
B.CLK
B.GND
GND
RESET
CD
HALT
S601 (⏮/◀◀ SKIP/SEARCH)
S602 (▶▶/⏭ SKIP/SEARCH)
S603 (REPEAT)
S604 (RANDON)
S605 (LAST FADE)
S606 (J.FIT)
S607 (ALBUM)
S608 (▲ OPEN/ (CLOSE)
S611 (□)
S612 (OO)
S613 (▷)
D602-604 MA165TA
IC790
TA7291S
MOTOR DRIVE
LOADING MOTOR
C790 10V82
CP790
CN401
S790 (CLOSE DET.)
S791 (OPEN DET.)
X601 (4.23MHz)
R605 100
R606 100K
R607 10K
C606 Z0.01
C608 Z0.01
L601 10μH
D606 SPR-305MDTF(▷)
D608 MA165TA
D609 MA165TA
R619 150
R618 150
R616 100K
R601 47K
R602 47K
R603 47K
R604 47K
F=4.23MHz
T=6.4ms
IC601
M38112M4104F
SYSTEM CONTROL & FL DRIVE
KS1
KS2
KIN0
KIN1
KIN2
KIN3
DIN
DOUT
CLK
CS
REQ
C601 Z0.1
C604 6.3V47
R610 100
R611 100
R612 100
R613 100
R609 1K
R608 1K
CP601
CN601
C605 K1000P
D610 MA4051MTA
R615 120
R614 120
R620 1.2
R621 1.2
C603 50V3.3
C602 50V3.3
FL DISPLAY
FL601 (RSL0185-F)
CN402
REST SN
SUBC
/RST
STAT
SBCK
SUBQ
SQCK
BLKCK
/FLOCK
SENSE
MLD
MDATA
MCLK
P.GND
+B(1)
TX
/CLOCK
D.GND
+B(2)
R ch IN
A.GND
L ch IN
R414 1K
R428 22K
C403 K1000P
C404 Z0.01
R429 1K
R421 22K
R402 1K
R411 4.7K
R412 1K
R413 4.7K
R427 10K
F:7.5Hz
T:13.6ms.
IC401
LC66304A4D86
SYSTEM CONTROL
X401 (4.23MHz)
R415 1M
R403 1K
/MLD
MDATA
TEST
Vss
OSC1
OSC2
/RST
MCLK
ENPHA
MUTE
REQ
DT
CLK
/TLOCK
/FLOCK
SENSE
/OPEN
/CLOSE
OPEN SW
CLOSE SW
VDD
REST SW
SERVO RST
DMUTE
CDIRX
GMUTE
R409 10K
R410 10K
C402 Z0.1
R404 1.5K
R405 1.5K
R406 1.5K
R407 1.5K
R408 100K
C401 Z0.1
ΔIC1
LM2940
REGULAT
C7 6.3V22
R801 1K
R802 1K
C803 K1000P
C804 K1000P
R803 100K
R804 100K

## D MAIN CIRCUIT(SYSTEM CONTROL/L.P. FILTER AMP/SWITCHING/REGULATOR)


ΔQ5
2SB1238QRTV6
REGULATOR
ΔD12
MA185TA
ΔIC1
LM2940T5M
REGULATOR
Q1,2,4
2SD2137PQTA
REGULATOR
ΔQ1
ΔQ2
ΔQ4
D3
RLIN4003NO2
ΔD1
RLIN4003NO2
ΔD2
RLIN4003NO2
ΔL1
ΔL2
L3 3.3μH
L4 3.3μH
AC
GND
POWER SUPPLY POINT
JK801
AC
BUS CLK
CT GND
BUS DATA
AC
DC GND
R ch OUT
A.GND
L ch OUT
To ST-CH510:JK203
/RS-CH510:JK1
Q801
UN4112TA
SWITCHING CONT.
IC801
XRA4558FTI
L.P FILTER AMP
IC802
TC4066BFTPI
SWITCHING
E1

• This schematic diagram may be modified at any time with the development of new technology.

**Notes:**

- **S601** : R. Skip/Search switch (⏮/◀◀)
- **S602** : F. Skip/Search switch (▶▶/⏭)
- **S603** : Repeat switch (REPEAT)
- **S604** : Random play switch (RANDOM)
- **S605** : AI edit (LAST FADE) switch
- **S606** : AI edit (J.FIT) switch
- **S607** : AI edit (ALBUM) switch
- **S608** : Disc tray open/close switch (⏏ OPEN/CLOSE)
- **S611** : Stop switch (□)
- **S612** : Pause switch (▯▯)
- **S613** : Play switch (▷)
- **S701** : Reset switch
- **S790** : Disc tray close detection switch
- **S791** : Disc tray open detection switch
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

  No mark : CD STOP
  ( ) : CD PLAY [1kHz, L + R, 0 dB]

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

- **Voltage and signal line**
  ——— : Positive voltage line
  – – – – : Negative voltage line
  ░░▶░░ : CD signal Line

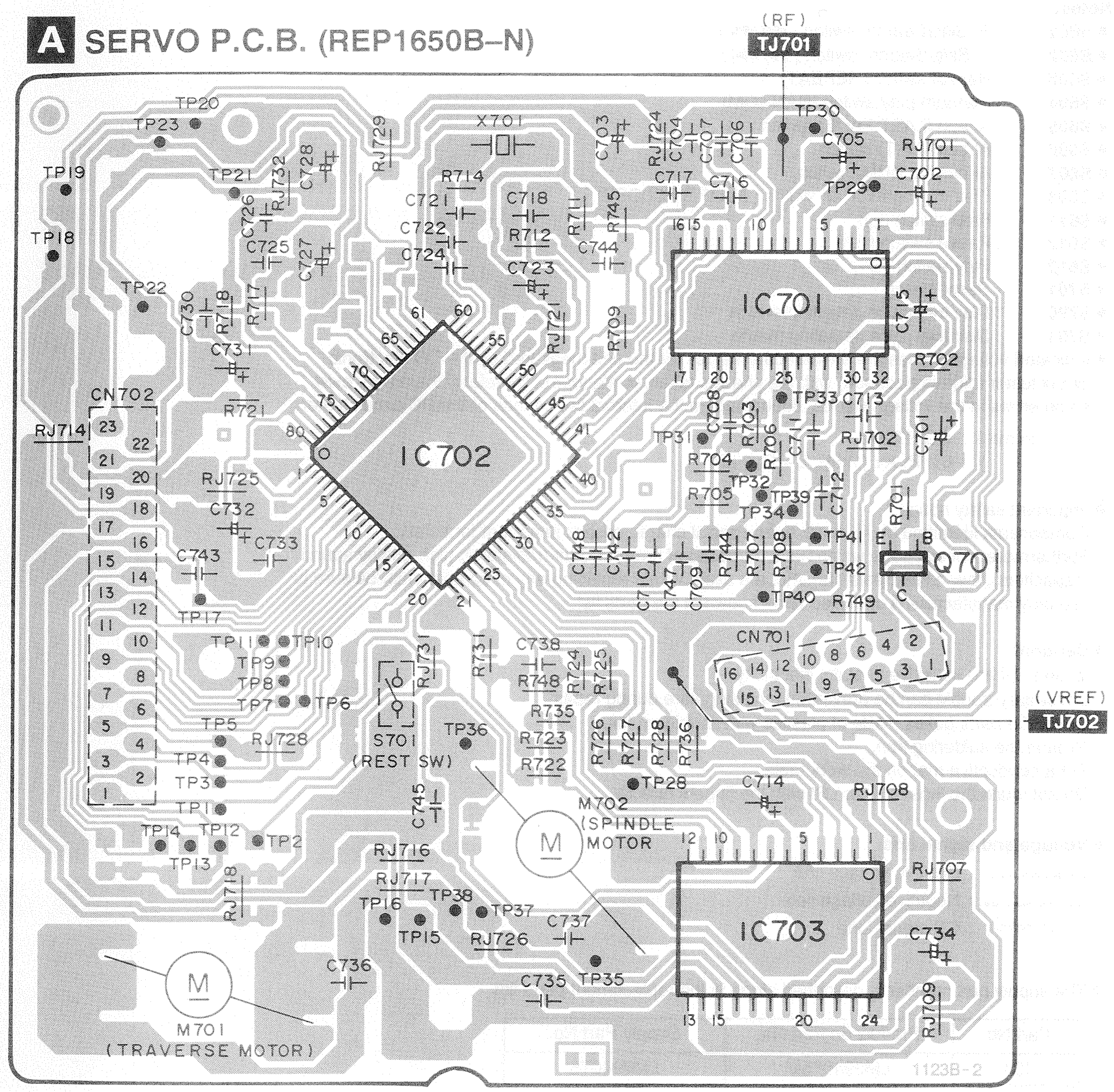
- The supply part number is described alone in the replacement parts list.

| Part No. | Production Part No. | Supply Part No. |
|---|---|---|
| IC1 | LM2940T5M | LM2940T5 |

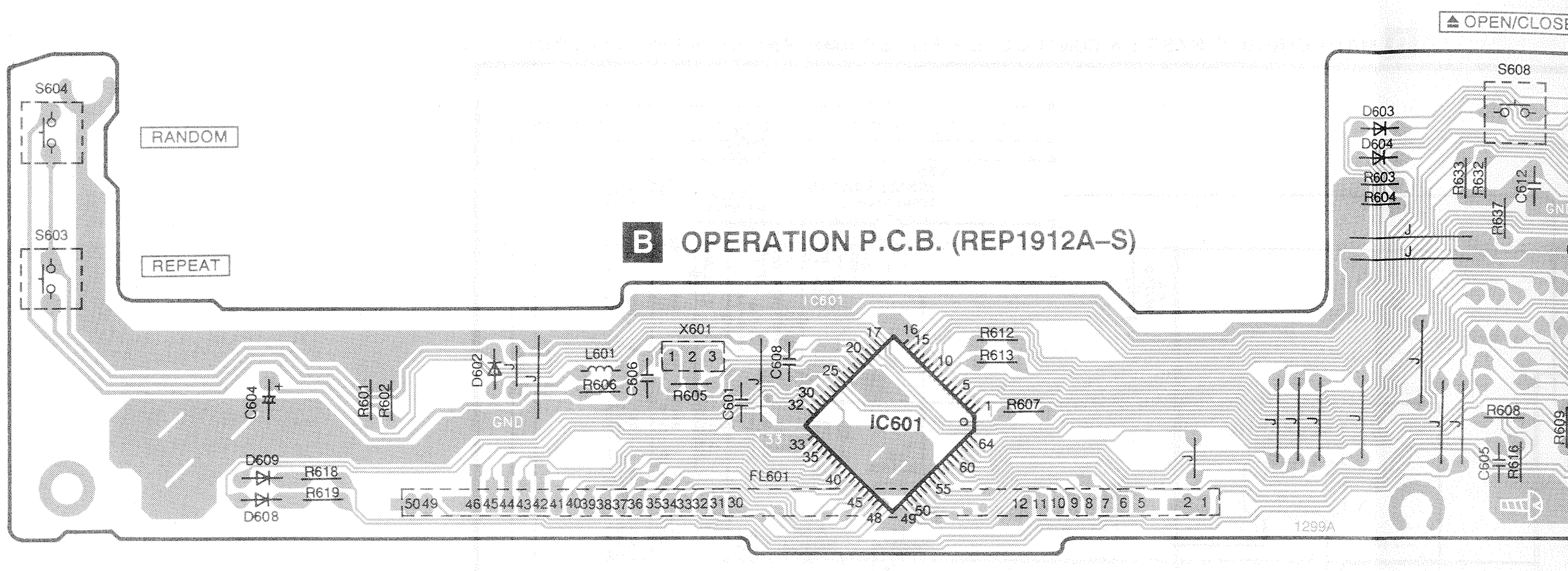
## Printed Circuit Board Diagram

- This circuit board diagram may be modified at any time with the development of new technology.

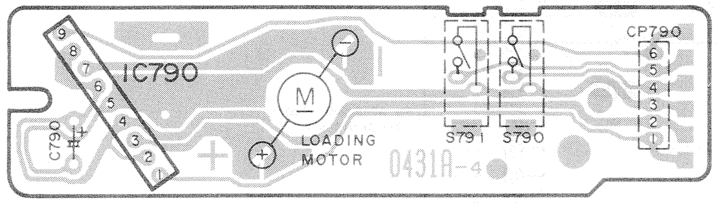
### A SERVO P.C.B. (REP1650B–N)


(RF)
TJ701
(VREF)
TJ702
IC701
IC702
IC703
Q701
X701
CN701
CN702
S701
(REST SW)
M701
(TRAVERSE MOTOR)
M702
(SPINDLE MOTOR)
1123B-2

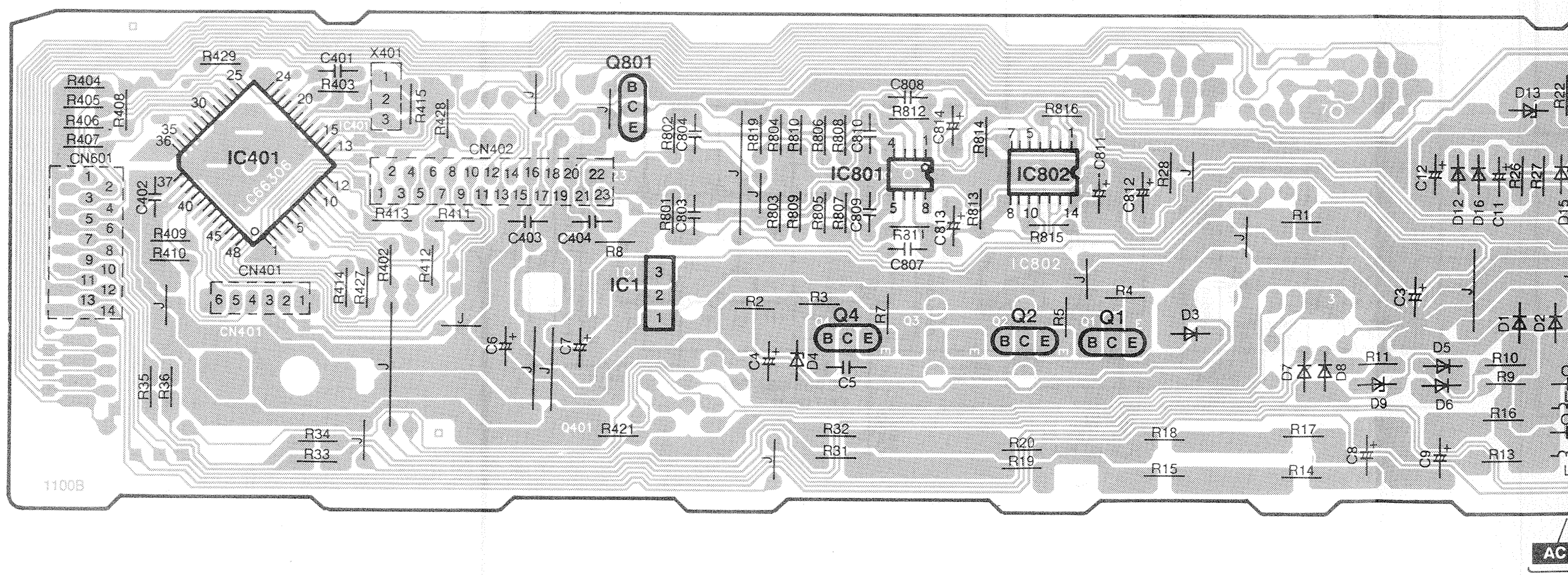
### B OPERATION P.C.B. (REP1912A–S)


OPEN/CLOSE
S604
RANDOM
S603
REPEAT
S608
IC601
X601
L601
FL601
D602
D603
D604
D608
D609
GND
1299A

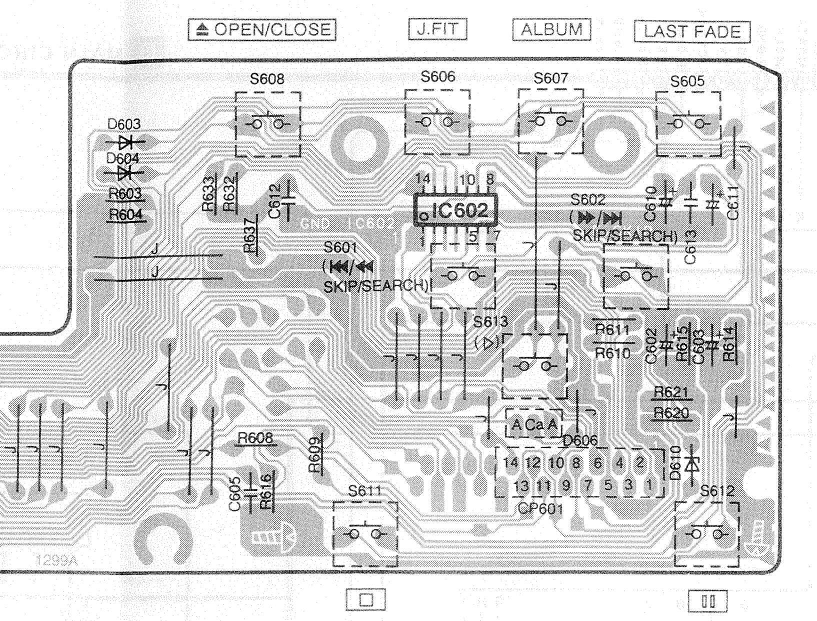
### C LOADING MOTOR P.C.B. (REP0767)

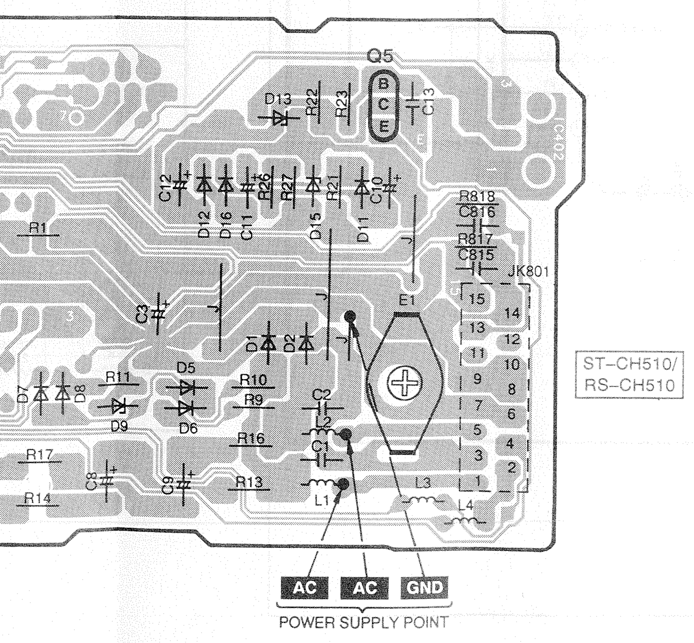

IC790
M
LOADING MOTOR
S791
S790
CP790
0431A-4

### D MAIN P.C.B. (REP1911B–M)

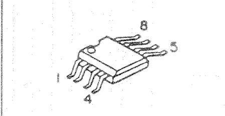
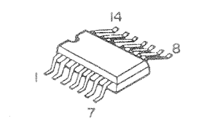
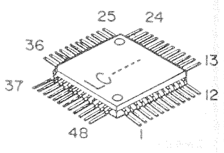
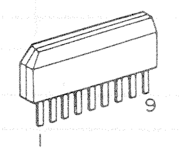
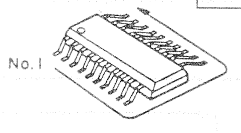
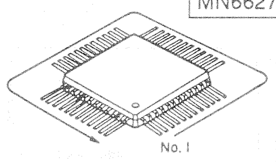
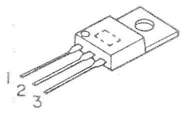
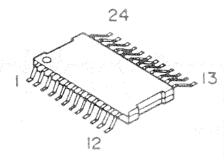
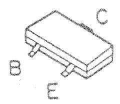
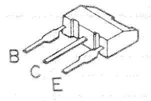
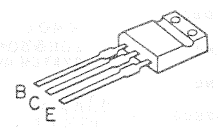
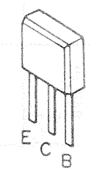
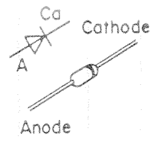
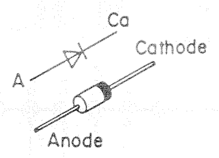
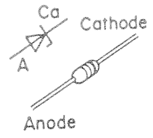
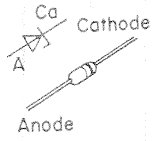
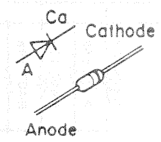
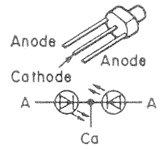

IC401
X401
CN401
CN402
CN601
Q801
IC801
IC802
IC1
Q1
Q2
Q4
1100B

10 11 12 13 14

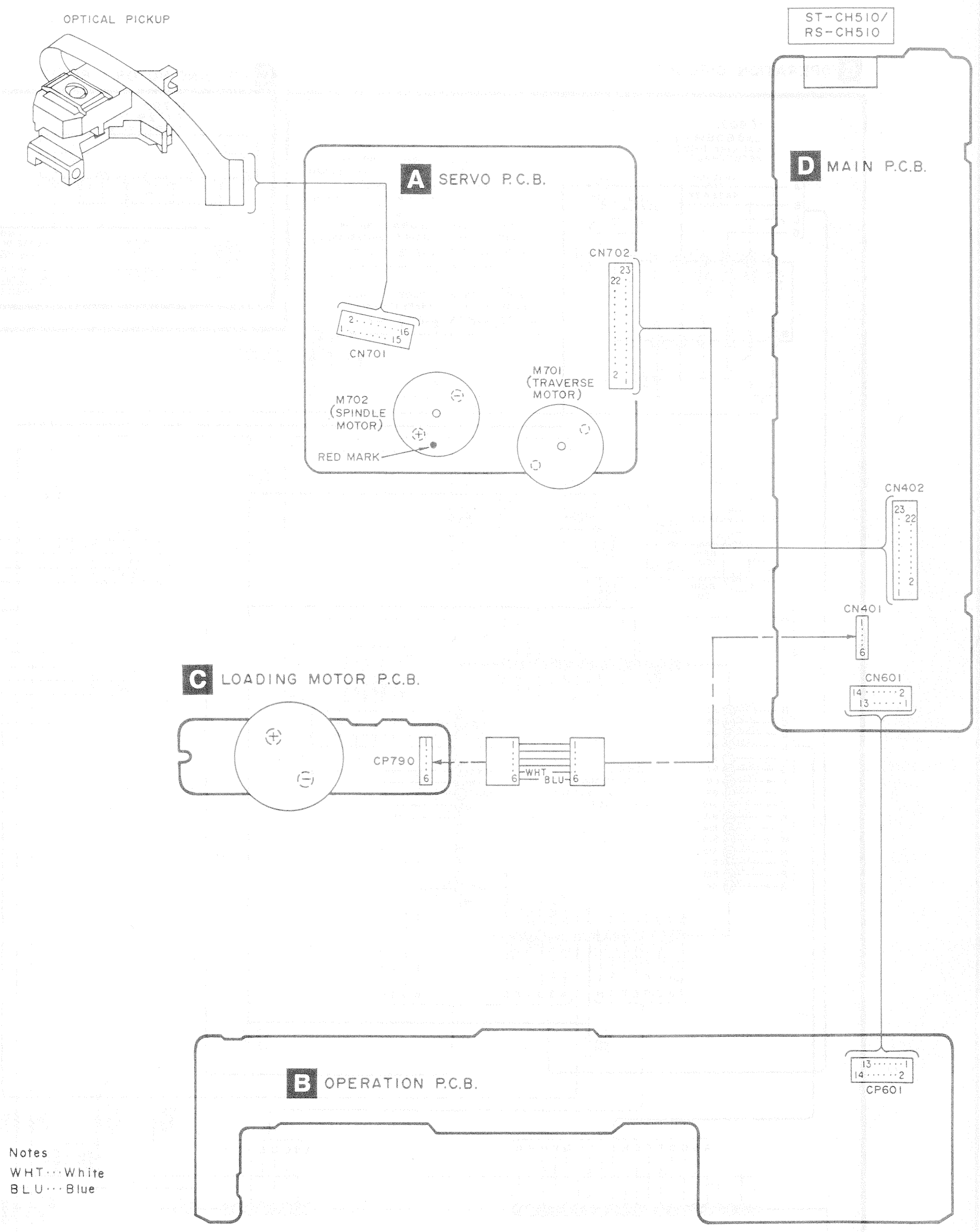

OPEN/CLOSE
J.FIT
ALBUM
LAST FADE
S608
S606
S607
S605
D603
D604
R603
R604
R633
R632
R637
C612
IC602
GND
S601
(|◀◀/◀◀
SKIP/SEARCH)
S602
(▶▶/▶▶|
SKIP/SEARCH)
C610
C611
C613
S613
(▷)
R611
R610
C602
R615
C603
R614
R621
R620
R608
R609
C605
R616
S611
D606
CP601
D610
S612
1299A
□
▯▯


Q5
B
C
E
D13
R22
R23
C13
C12
D12
D16
C11
R26
R27
R21
D15
D11
C10
R1
R818
C816
R817
C815
JK801
C3
E1
D7
D8
R11
D9
D5
D6
R10
R9
C2
R16
R17
R14
C8
C9
R13
L1
L3
L4
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
ST-CH510/
RS-CH510
AC
AC
GND
POWER SUPPLY POINT

## ● Terminal Guide of IC's, Transistors and Diodes

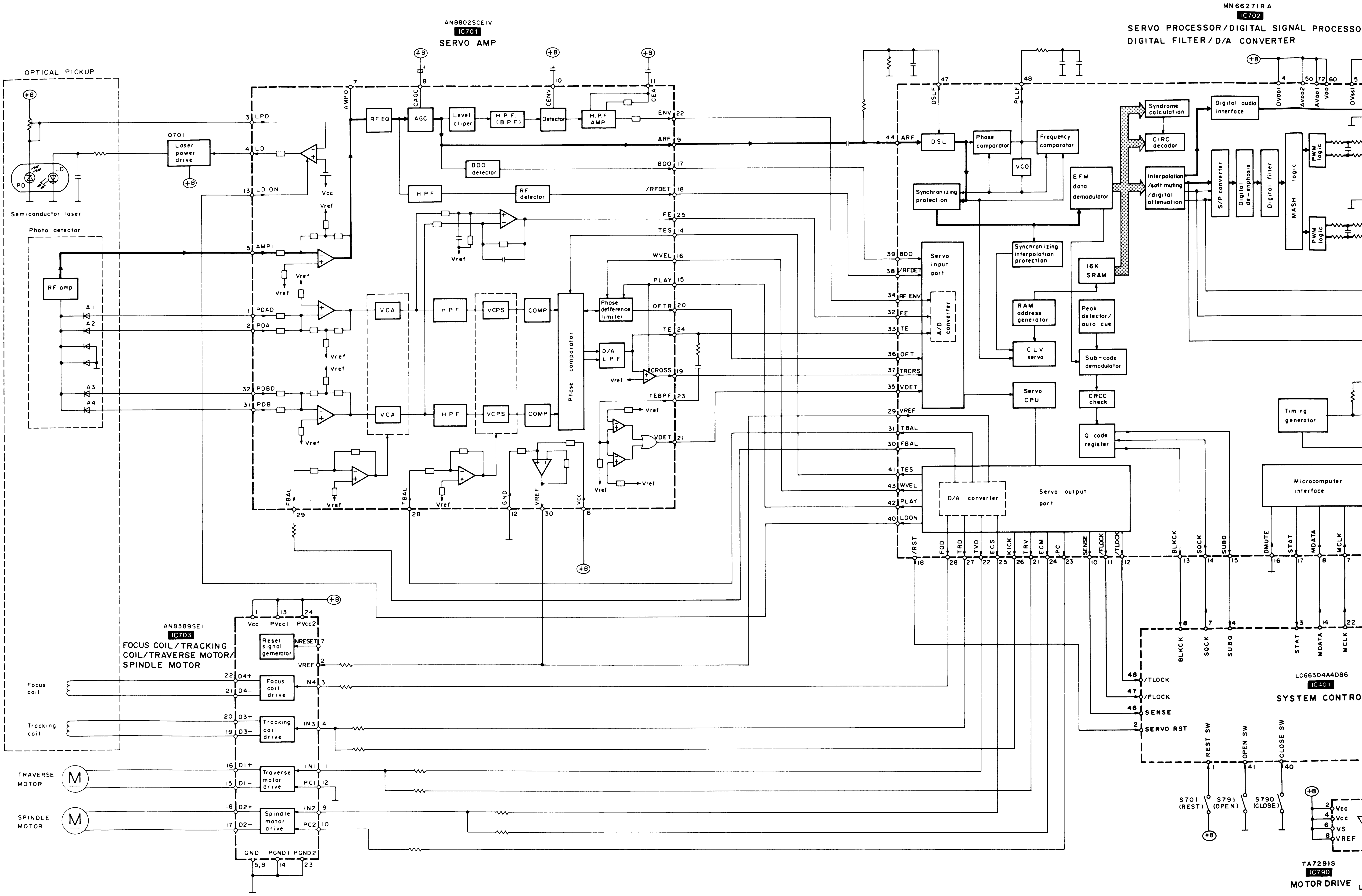
| | | |
|---|---|---|
| XRA4558FT1<br> | TC4066BFTP1<br> | LC66304A4D86<br> 25<br>24<br>36<br>13<br>37<br>12<br>48<br>1 |
| TA7291S<br> | LA5608M-TE-L 14Pin<br>AN8802SCE1V 32Pin<br> | |
| M38112M4104F 64Pin<br>MN66271RA 80Pin<br> | | LM2940T5<br> |
| AN8389SE1<br> | 2SB709S<br> | 2SB1238QRTV6<br> |
| 2SD2137PQTA<br> | UN4112<br> | MA165<br>MA167<br> Ca<br>Cathode<br>A<br>Anode |
| RL1N4003N02<br> Ca<br>Cathode<br>A<br>Anode | MA4051MTA<br>MA4082LTA<br> Ca<br>Cathode<br>A<br>Anode | MA4270HTA<br> Ca<br>Cathode<br>A<br>Anode |
| MA185TA<br> Ca<br>Cathode<br>A<br>Anode | SPR-305MDTF<br> Anode<br>Anode<br>Cathode<br>A<br>A<br>Ca | |

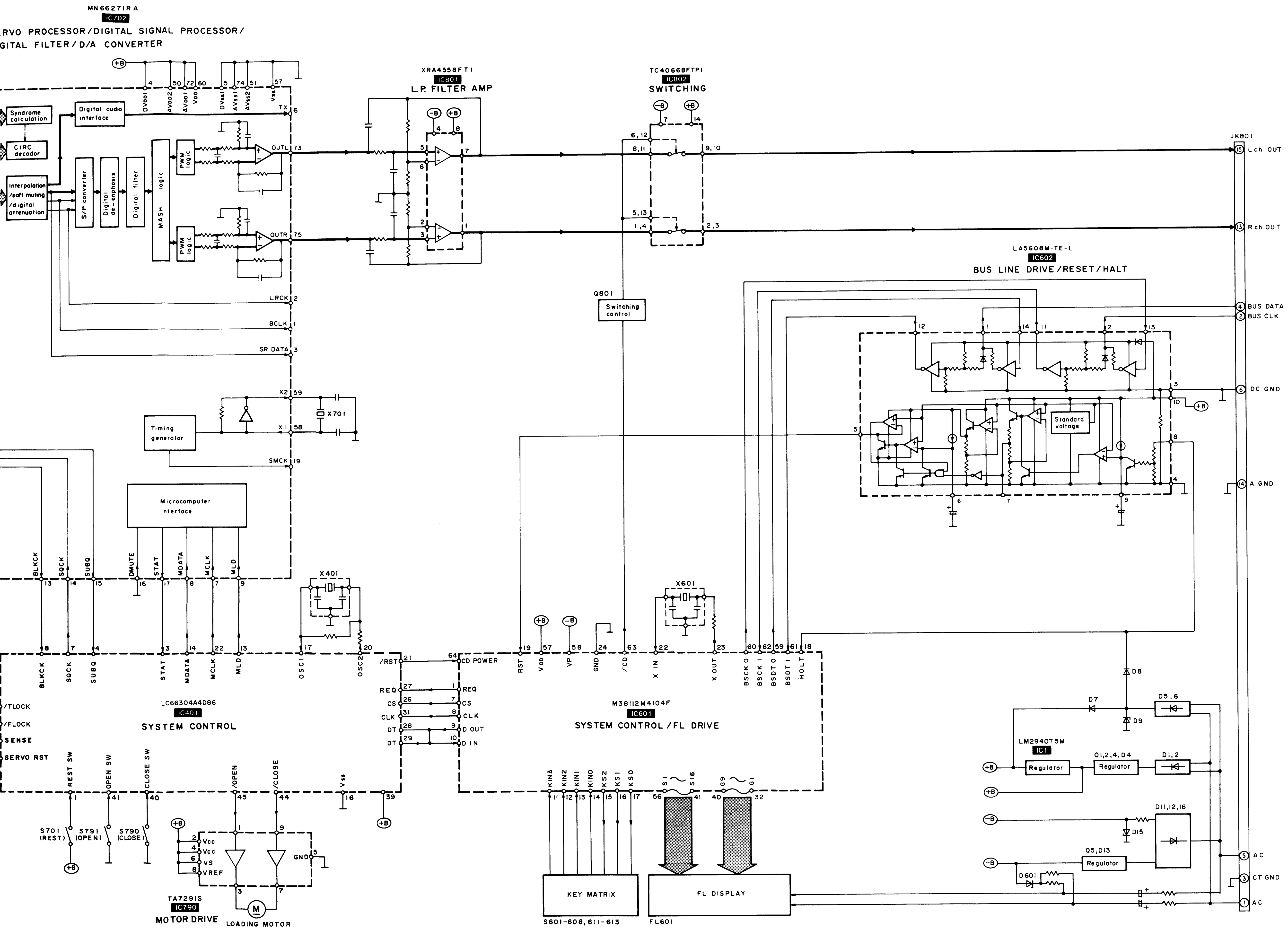
## ■ Wiring Connection Diagram


OPTICAL PICKUP
ST-CH510/
RS-CH510
A SERVO P.C.B.
D MAIN P.C.B.
CN702
23
22
2
1
CN701
2
1
16
15
M702
(SPINDLE
MOTOR)
M701
(TRAVERSE
MOTOR)
RED MARK
CN402
23
22
2
1
CN401
1
6
CN601
14
2
13
1
C LOADING MOTOR P.C.B.
CP790
1
6
WHT
BLU
B OPERATION P.C.B.
13
1
14
2
CP601

Notes
WHT···White
BLU···Blue

# ■ Block Diagram


AN8802SCEIV
IC701
SERVO AMP
MN66271RA
IC702
SERVO PROCESSOR/DIGITAL SIGNAL PROCESSO
DIGITAL FILTER/D/A CONVERTER
OPTICAL PICKUP
PD
LD
Semiconductor laser
Photo detector
RF amp
A1
A2
A3
A4
Q701
Laser power drive
LPD
LD
LD ON
AMPI
PDAD
PDA
PDBD
PDB
AMPO
CAGC
CENV
CEA
RF EQ
AGC
Level cliper
HPF (BPF)
Detector
HPF AMP
BDO detector
HPF
RF detector
VCA
VCPS
COMP
Phase comparator
Phase defference limiter
D/A LPF
ENV
ARF
BDO
/RFDET
FE
TES
WVEL
PLAY
OFTR
TE
CROSS
TEBPF
VDET
FBAL
TBAL
GND
VREF
Vcc
Vref
DSLF
PLLF
DSL
Phase comparator
Frequency comparator
VCO
Synchronizing protection
EFM data demodulator
Syndrome calculation
CIRC decodor
Interpolation /soft muting /digital attenuation
Digital audio interface
S/P converter
Digital de-enphasis
Digital filter
MASH logic
PWM logic
16K SRAM
Synchronizing interpolation protection
RAM address generator
CLV servo
Servo CPU
Peak detector/ auto cue
Sub-code demodulator
CRCC check
Q code register
Timing generator
Microcomputer interface
Servo input port
A/D converter
RF ENV
OFT
TRCRS
VREF
TBAL
FBAL
WVEL
LDON
D/A converter
Servo output port
/RST
FOD
TRD
TVD
ECS
KICK
TRV
ECM
PC
SENSE
/FLOCK
/TLOCK
BLKCK
SQCK
SUBQ
DMUTE
STAT
MDATA
MCLK
DVDD1
AVDD2
AVDD1
VDD
DVSS1
AN8389SE1
IC703
FOCUS COIL/TRACKING COIL/TRAVERSE MOTOR/ SPINDLE MOTOR
Vcc
PVcc1
PVcc2
Reset signal generator
NRESET
VREF
Focus coil
D4+
D4−
Focus coil drive
IN4
Tracking coil
D3+
D3−
Tracking coil drive
IN3
TRAVERSE MOTOR
D1+
D1−
Traverse motor drive
IN1
PC1
SPINDLE MOTOR
D2+
D2−
Spindle motor drive
IN2
PC2
GND
PGND1
PGND2
LC66304A4D86
IC401
SYSTEM CONTRO
/TLOCK
/FLOCK
SENSE
SERVO RST
REST SW
OPEN SW
CLOSE SW
S701 (REST)
S791 (OPEN)
S790 (CLOSE)
Vcc
VS
VREF
TA7291S
IC790
MOTOR DRIVE
+B


MN66271RA
IC702
ERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/
GITAL FILTER/D/A CONVERTER
Syndrome calculation
CIRC decoder
Interpolation /soft muting /digital attenuation
Digital audio interface
S/P converter
Digital de-emphasis
Digital filter
MASH logic
PWM logic
DVDD1
AVDD2
AVDD1
VDD
DVss1
AVss1
AVss2
Vss
TX
OUTL
OUTR
LRCK
BCLK
SR DATA
X2
X1
X701
Timing generator
SMCK
Microcomputer interface
BLKCK
SQCK
SUBQ
DMUTE
STAT
MDATA
MCLK
MLD
XRA4558FT1
IC801
L.P. FILTER AMP
TC4066BFTP1
IC802
SWITCHING
Q801
Switching control
JK801
Lch OUT
Rch OUT
BUS DATA
BUS CLK
DC GND
A GND
AC
CT GND
AC
LA5608M-TE-L
IC602
BUS LINE DRIVE/RESET/HALT
Standard voltage
X401
X601
LC66304A4D86
IC401
SYSTEM CONTROL
/TLOCK
/FLOCK
SENSE
SERVO RST
REST SW
OPEN SW
CLOSE SW
/OPEN
/CLOSE
Vss
OSC1
OSC2
/RST
REQ
CS
CLK
DT
DT
CD POWER
REQ
CS
CLK
D OUT
D IN
M38112M4104F
IC601
SYSTEM CONTROL/FL DRIVE
RST
VDD
VP
GND
/CD
X IN
X OUT
BSCK O
BSCK I
BSDT O
BSDT I
HOLT
KIN3
KIN2
KIN1
KIN0
KS2
KS1
KS0
S1
S16
G9
G1
KEY MATRIX
S601-608, 611-613
FL DISPLAY
FL601
S701 (REST)
S791 (OPEN)
S790 (CLOSE)
Vcc
Vcc
VS
VREF
GND
TA7291S
IC790
MOTOR DRIVE
LOADING MOTOR
D8
D7
D9
D5,6
LM2940T5M
IC1
Regulator
Q1,2,4,D4
Regulator
D1,2
D11,12,16
D15
Q5,D13
Regulator
D601
+B
-B

# ■About the Self-Diagnostic Mode

**This unit is equipped with a self-diagnostic function which, in the event of a malfunction, automatically displays a code indicating the nature of the malfunction. Use this self-diagnostic function when servicing the unit.**

**SC-CH510 (SL-CH510, ST-CH510, SE-CH510, RS-CH510, SB-CH510A)**

**Display method**

**To display the malfunction code**

U-70:...........Automatically displays on the tuner/sound processor and the CD player when a malfunction occurs.

F-61 ...........Automatically displays on the tuner/sound processor when a malfunction occurs.

**To return to the normal display**

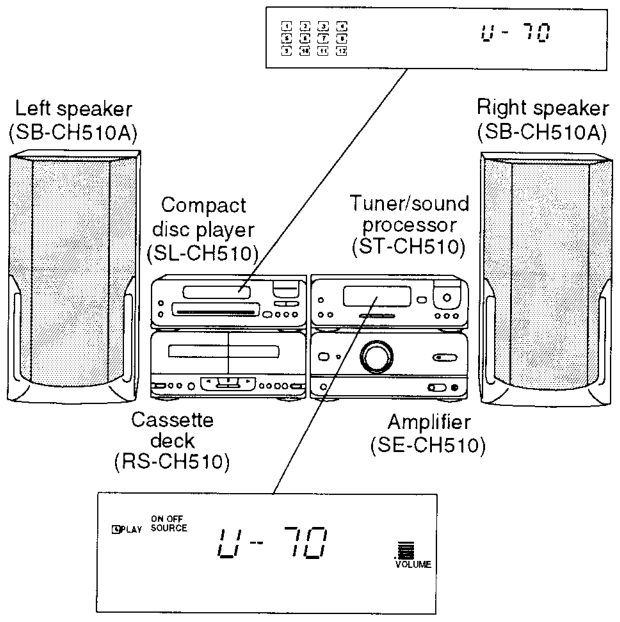
**1. For U-70:**

- Press an operation button (any button other than the OPEN/CLOSE button) on the unit (tuner/sound processor or CD player) which displayed "U-70".
- To re-display the code, switch the power off (POWER STANDBY button), and then switch power back on again.

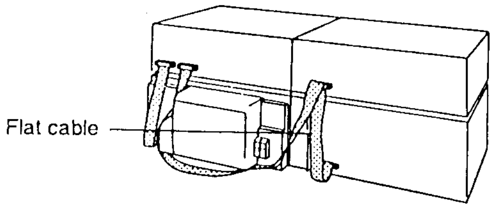
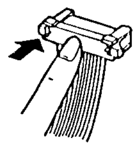
**2. For F-61:**

- If "F-61" is displayed, the power will automatically be switched off and the standby indicator will light up.
- "F-61" will be displayed for 3 seconds, and then the clock will be displayed.
- To re-display the code, switch the power on. "F-61" will be re-displayed, and then after 3 seconds the clock will be displayed and the power will automatically switch off.

**Display location**



**Display contents**

| Display code | Problem or condition | Correction procedure |
|---|---|---|
| **U-70**<br>(displayed automatically) | A bus-line communications error has occurred as a result of the flat cables being inserted incorrectly, thus preventing the system from operating.<br>1. If "U-70" is displayed on the tuner/sound processor, the tape deck cannot be operated by remote control.<br>2. If "U-70" is displayed on the CD player, the CD player cannot be operated by remote control. |  <br>1. To check for correct insertion of the flat cables<br>①Match each connector with the color (black/white) of the connection port and insert until you hear a click.<br>②Insert the flat cables at the back of the unit in the order indicated. Make sure the which side of the cable is on your right side. <br>2. Breakage of flat cable (Check and replace as necessary.)<br>3. If the problem is not corrected by items (1.) and (2.) above, this indicates a faulty IC.<br>**SL-CH510:**<br>IC601 (M38112M4102F)<br>IC602 (LA5608M-TE-L)<br>Check these IC's and replace as necessary. |
| **F-61** | When the power switch is switched on, it automatically switches back off, making it impossible to switch power on. | 1. Faulty amplifier (SE-CH510) output IC (IC501).<br>2. Fan motor is burnt out, locked, or stopped.<br>3. Replace the output IC or fan motor as necessary. |

# ■ Automatic Adjustment Results Display Function

## Self-Check Function

**The SL-CH510 unit has a function that uses the FL display board to indicate the results of automatic adjustment of the servo-circuit (tracking, focus, offset, etc.) as error codes. The error code display indicates the location of failures from automatic adjustment circuit.**

**The following procedure displays the error codes from the self-diagnostic function.**

### ● Procedure for displaying automatic adjustment codes

1. Set the unit in the servo P.C.B. checking mode (refer to page 6).
2. Turn on the power supply switch (refer to page 9) while pressing the STOP ( ■ ) and REPEAT buttons at the same time.
3. The "C-2" code is displayed 2 or 3 seconds later to indicate the automatic adjustment mode.

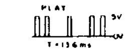
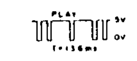
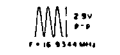
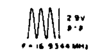
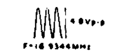
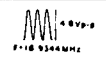
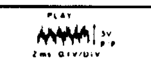
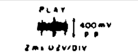
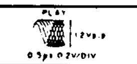
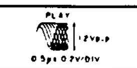
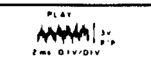
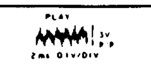
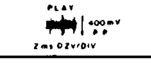
   **Note:**

   When the SL-CH510 is removed from its set and then operated, "U-70" is displayed on the FL display as an error code.
   Even if the buttons are pushed continuously after this indication, the display will automatically change to "C-2".
4. After automatic adjustment, the code display indicates the location of failures in the servo circuit.

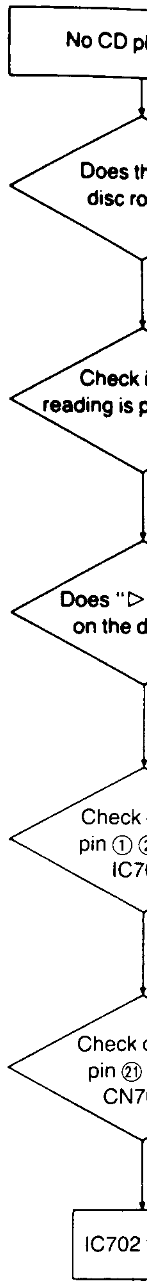
### ● Troubleshooting using the automatic adjustment code

**Notes:**

1. If "E-00" is displayed as an error code, this means no error was found.
2. Check the disc and laser-detector lens for damage, contamination or stains.

| FL error code display | Symptom | Probable cause | Signal to check | | Normal voltage and waveform values | |
|---|---|---|---|---|---|---|
| | | | Location | Signal name | PLAY | STOP |
| E-01 | Focus and tracking offset adjustments not completed in specified time period. | ① Clocks X1 and X2, power supply VDD, and reset/RST, all on IC702.<br>② MDATA, MCLK, MLD, and SENSE signals to/from mechanism controller. | IC702 ⑧ pin | MDATA |  | 4.8V |
| | | | IC702 ⑦ pin | MCLK |  | 4.8V |
| | | | IC702 ⑨ pin | MLD | | |
| | | | IC702 ⑩ pin | SENSE | 0V | 0V |
| | | | IC702 ⑱ pin | /RST | 4.9V | 4.9V |
| | | | IC702 (58) pin | X1 |  |  |
| | | | IC702 (59) pin | X2 |  |  |
| E-03<br>E-05<br>E-07<br>E-09<br>E-0B<br>E-0D<br>E-0F | Disc play unstable | ① Scratches or contaminants on disc surface<br>② Focus and Tracking servo circuits (check waveforms, voltages, and part values.)<br>③ Spindle driver circuit<br>④ Optical pickup | IC702 ㉜ pin | F E |  | 2.4V |
| | | | IC702 ㉝ pin | T E |  | 2.4V |
| | | | IC702 ㉘ pin | FOD | 2.4V | 2.4V |
| | | | IC702 ㉗ pin | TRD | 2.4V | 2.4V |
| | | | IC702 ㉖ pin | KICK | 2.4V | 2.4V |
| | | | IC702 ⑪ pin | /FLOCK | 0V | 4.9V |
| | | | IC702 ㊳ pin | /RF DET | 0V | 4.8V |
| | | | TJ701 | R F |  | 3.4V |
| | | | IC702 ⑰ pin | STAT | 4.9V | 0V |
| E-4<br>E-6<br>E-C<br>E-E | Best "eye" (PD balance) adjustment not completed in specified time period. | ① Scratches or contaminants on disc surface<br>② Focus servo circuits (check waveforms, voltages, and part values.)<br>③ Optical pickup | IC702 ㉚ pin | FBAL | 2.5V ± 1.25V | 2.5V ± 1.25V |
| | | | TJ701 | R F |  | 3.4V |
| | | | IC702 ㉜ pin | F E |  | 0V |
| | | | IC702 ㊱ pin | O F T | 0V | 0V |
| | | | IC702 ⑫ pin | /TLOCK | 0V | 0V |
| E-8<br>E-A | Focus or Tracking gain adjustment not completed in specified time period. | ① Scratches or contaminants on disc surface<br>② Focus and Tracking servo circuit (check waveforms, voltages, and part values.)<br>③ Optical pickup | IC702 ㉜ pin | F E |  | 2.4V |
| | | | IC702 ㉝ pin | T E |  | 2.4V |
| | | | IC702 ㊱ pin | O F T | 0V | 0V |
| | | | IC702 ⑫ pin | /TLOCK | 0V | 0V |

# ■ Trou



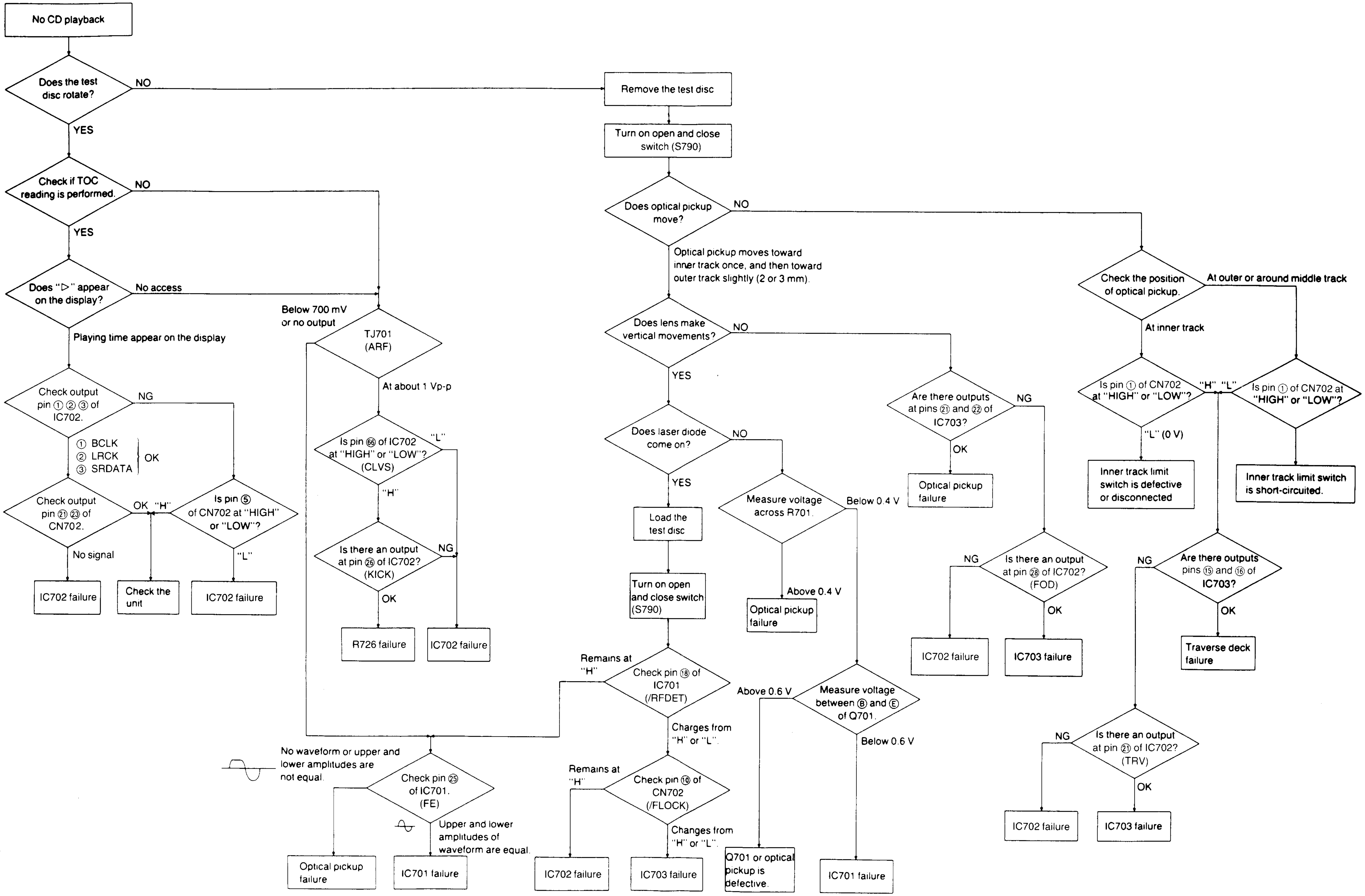
stment
tion of

e time.

code.

nd
s
STOP
4.8V
4.8V
0V
4.9V
2.4V
2.4V
2.4V
2.4V
2.4V
4.9V
4.8V
3.4V
0V
/ ± 1.25V
3.4V
0V
0V
0V
2.4V
2.4V
0V
0V

## ■ Troubleshooting Guide


No CD playback
Does the test disc rotate?
NO
YES
Remove the test disc
Turn on open and close switch (S790)
Check if TOC reading is performed.
NO
YES
Does "▷" appear on the display?
No access
Playing time appear on the display
Check output pin ① ② ③ of IC702.
NG
① BCLK
② LRCK
③ SRDATA
OK
Check output pin ㉑ ㉓ of CN702.
OK "H"
Is pin ⑤ of CN702 at "HIGH" or "LOW"?
"L"
No signal
IC702 failure
Check the unit
IC702 failure
Below 700 mV or no output
TJ701 (ARF)
At about 1 Vp-p
Is pin ㊅ of IC702 at "HIGH" or "LOW"? (CLVS)
"L"
"H"
Is there an output at pin ㉖ of IC702? (KICK)
NG
OK
R726 failure
IC702 failure
No waveform or upper and lower amplitudes are not equal.
Check pin ㉕ of IC701. (FE)
Upper and lower amplitudes of waveform are equal.
Optical pickup failure
IC701 failure
Does optical pickup move?
NO
Optical pickup moves toward inner track once, and then toward outer track slightly (2 or 3 mm).
Does lens make vertical movements?
NO
YES
Does laser diode come on?
NO
YES
Load the test disc
Turn on open and close switch (S790)
Remains at "H"
Check pin ⑱ of IC701 (/RFDET)
Charges from "H" or "L".
Remains at "H"
Check pin ⑩ of CN702 (/FLOCK)
Changes from "H" or "L".
IC702 failure
IC703 failure
Measure voltage across R701.
Below 0.4 V
Above 0.4 V
Optical pickup failure
Measure voltage between Ⓑ and Ⓔ of Q701.
Above 0.6 V
Below 0.6 V
Q701 or optical pickup is defective.
IC701 failure
Are there outputs at pins ㉑ and ㉒ of IC703?
NG
OK
Optical pickup failure
Is there an output at pin ㉘ of IC702? (FOD)
NG
OK
IC702 failure
IC703 failure
Check the position of optical pickup.
At outer or around middle track
At inner track
Is pin ① of CN702 at "HIGH" or "LOW"?
"H"
"L"
"L" (0 V)
Inner track limit switch is defective or disconnected
Is pin ① of CN702 at "HIGH" or "LOW"?
Inner track limit switch is short-circuited.
Are there outputs pins ⑮ and ⑯ of IC703?
NG
OK
Traverse deck failure
Is there an output at pin ㉑ of IC702? (TRV)
NG
OK
IC702 failure
IC703 failure

# ■ Function of IC Terminals

## • IC401 (LC66304A4D86)

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | REST SW | I | Innermost track sense switch detection signal input |
| 2 | SERVO RST | O | Reset signal output |
| 3 | STAT | I | Status signal input |
| 4 | SUBQ | I | Sub-code Q data input |
| 5 | DMUTE | — | Unused, open |
| 6 | NC | — | Connected to VDD (+5 V) |
| 7 | SQCK | O | Sub-code Q data clock output |
| 8 | BLKCK | I | Sub-code block data clock input |
| 9 | ODI RX | I | Connected to VDD (+5V) |
| 10 | GMUTE | — | Unused, open |
| 11 | NU | — | |
| 12 | NU | — | Connected to VDD (+5 V) |
| 13 | /MLD | O | Microprocessor command load signal output |
| 14 | MDATA | O | Microprocessor command data output |
| 15 | TEST | — | Connected to GND |
| 16 | VSS | — | |
| 17 | OSC1 | I | Clock signal input from X401 (4.23 MHz) |
| 18 | NC | — | Connected to GND |
| 19 | NC | — | |
| 20 | OSC2 | O | Clock signal output for X401 (4.23 MHz) |
| 21 | /RST | I | Reset signal input |
| 22 | MCLK | O | Microprocessor command clock output |
| 23 | NU | — | Unused, open |
| 24 | ENPHA | — | |
| 25 | MUTE | — | |

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 26 | CS | I | Input the serial data communication starting signal from IC601 of system control |
| 27 | REQ | I | Input the command request data signal from IC601 of system control |
| 28 | DT | I/O | Input/output the serial data signal |
| 29 | | | |
| 30 | NC | — | Connected to GND |
| 31 | CLK | O | Output the serial clock signal from IC601 of system control |
| 32 | NU | — | Unused, open |
| 33 | NU | — | Connected to GND |
| 34 | | | |
| 35 | | | |
| 36 | CS | — | |
| 37 | NU | — | |
| 38 | CS | — | Connected to VDD (+5 V) |
| 39 | VDD | I | Power supply (+5 V) |
| 40 | CLOSE SW | I | Disc tray "close" sense switch detection signal input |
| 41 | OPEN SW | I | Disc tray "open" sense switch detection signal input |
| 42 | NC | — | Connected to VDD (+5 V) |
| 43 | | | |
| 44 | /CLOSE | O | Disc tray "close" command signal output |
| 45 | /OPEN | O | Disc tray "open" command signal output |
| 46 | SENSE | I | Sense signal input |
| 47 | /FLOCK | I | Focus servo command signal input |
| 48 | /TLOCK | I | Tracking servo command signal input |

## • IC601 (M38112M4104F)

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | REQ | O | Output the command request data signal for IC401 of system control |
| 2 | GRST | — | Unused, open |
| 3<br>~<br>6 | NC | — | Unused, open |
| 7 | CS | O | Output the serial communication starting signal for IC401 of system control |
| 8 | CLK | I | Input the serial clock signal for IC401 of system control |
| 9 | DOUT | O | Output the serial data signal for IC401 of system control |
| 10 | DIN | I | Input the serial data signal from IC401 of system control |
| 11<br>~<br>14 | KIN3<br>~<br>KIN0 | I | Signal input from operation key |
| 15<br>~<br>17 | KS2<br>~<br>KS0 | O | Strobe signal output for operation key scanning |
| 18 | HOLT | I | Detection signal input for an electricity failure |
| 19 | RST | I | Reset signal input |
| 20 | XCIN | — | Connected to GND |
| 21 | XCOUT | — | Unused, open |
| 22 | XIN | I | Clock signal input from X601 (4.23 MHz) |
| 23 | XOUT | O | Clock signal output for X601 (4.23 MHz) |
| 24 | GND | — | Connected to GND |

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 25 | SCDG | I | Connected to GND |
| 26 | GMUTE | — | Unused, open |
| 27 | NU | — | Connected to GND |
| 28 | CS | — | Connected VDD (+5 V) |
| 29 | PLED1 | O | Output signal for PLAY LED lighting |
| 30 | PLED2 | | |
| 31 | NU | — | Unused, open |
| 32<br>~<br>40 | G1<br>~<br>G9 | O | Grid signal output for FL display |
| 41<br>~<br>56 | S16<br>~<br>S1 | O | Segment signal output for FL display |
| 57 | VDD | — | Supplied +5 V |
| 58 | VP | — | Supplied power to FL display for pulling down |
| 59 | BSDTO | O | Data signal output to bus |
| 60 | BSCKO | O | Clock signal output to bus |
| 61 | BSDTI | I | Data signal input from bus |
| 62 | BSCKI | I | Clock signal input from bus |
| 63 | /CD | O | AF signal switching |
| 64 | CD POWER | O | Reset signal output for IC401 |

## •IC703 (AN8389SE1)

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | Vcc | I | Power supply |
| 2 | VREF | I | VREF input |
| 3 | IN4 | I | Motor driver (4) input |
| 4 | IN3 | I | Motor driver (3) input |
| 5 | GND | — | Ground connection |
| 6 | NC | — | Ground connection |
| 7 | NRESET | — | Reset input |
| 8 | GND | — | Ground connection |
| 9 | IN2 | I | Motor driver (2) input |
| 10 | PC2 | I | PC2 (power cut) input |
| 11 | IN1 | I | Motor driver (1) input |
| 12 | PC1 | I | PC1 (power cut) input (no use, open) |

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 13 | PVcc1 | I | Power supply (1) for driver |
| 14 | PGND1 | — | Ground connection (1) for driver |
| 15 | D1– | O | Motor driver (1) reverse-action output |
| 16 | D1+ | O | Motor driver (1) forward-action output |
| 17 | D2– | O | Motor driver (2) reverse-action output |
| 18 | D2+ | O | Motor driver (2) forward-action output |
| 19 | D3– | O | Motor driver (3) reverse-action output |
| 20 | D3+ | O | Motor driver (3) forward-action output |
| 21 | D4– | O | Motor driver (4) reverse-action output |
| 22 | D4+ | O | Motor driver (4) forward-action output |
| 23 | PGND2 | — | Ground connection (2) for driver |
| 24 | PVcc2 | I | Power supply (2) for driver |

## •IC701 (AN8802SCE1V)

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | PDAD | I | PD A channel signal input with delay |
| 2 | PDA | I | PD A channel signal input without delay |
| 3 | LPD | I | Laser PD connection |
| 4 | LD | O | Power supply for LD driving |
| 5 | AMPI | I | RF amplifier input |
| 6 | Vcc | I | Power supply connection |
| 7 | AMPO | O | RF amplifier output (no use, open) |
| 8 | CAGC | I | AGC loop filter connection |
| 9 | ARF | O | RF AGC output |
| 10 | CENV | I | Capacitor connection for RF detection |
| 11 | CEA | I | Capacitor connection for HPF amplifier |
| 12 | GND | — | Ground connection |
| 13 | LDON | I | ON/OFF input of LD APC<br>("H": ON, "L": OFF) |
| 14 | TES | I | Tracking error shunt signal input<br>("H": shunt) |
| 15 | PLAY | I | Play signal input ("H": PLAY) |
| 16 | WVEL | I | WVEL control |
| 17 | BDO | O | BDO output |
| 18 | /RFDET | O | NRFDET output |
| 19 | CROSS | O | CROSS output |
| 20 | OFTR | O | OFTR output |
| 21 | VDET | O | VDET output |
| 22 | ENV | O | ENV output |
| 23 | TEBPF | I | Vibration detection input |
| 24 | TE | O | Tracking error output |
| 25 | FE | O | Focus error output |
| 26 | PTO | O | Potentioamplifier output (no use, open) |
| 27 | PTI | I | Potentioamplifier inversion input<br>(no use, open) |
| 28 | TBAL | I | Tracking balance input |
| 29 | FBAL | I | Focus balance input |
| 30 | VREF | O | VREF output |
| 31 | PDB | I | PD B channel signal input without delay |
| 32 | PDBD | I | PD B channel signal input with delay |

## •IC702 (MN66271RA)

| Pin No | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | BCLK | — | Bit clock output for serial data<br>(no used, open) |
| 2 | LRCK | — | L/R identification signal output<br>(no use, open) |
| 3 | SRDATA | — | Serial data output (no used, open) |
| 4 | DVDD1 | I | Power supply input (for digital circuit) |
| 5 | DVss1 | — | GND (for digital circuit) |
| 6 | TX | O | Digital audio interface signal output |
| 7 | MCLK | I | Microprocessor command clock signal input (Latches data at first transition) |
| 8 | MDATA | I | Microprocessor command data signal input |
| 9 | MLD | I | Microprocessor command load signal input |
| 10 | SENSE | O | Sence signal output<br>(OFT, FESL, MAGEND, NAJEND, POSAD, SFG) |
| 11 | /FLOCK | O | Focus servo feeding signal output<br>("L": Feed) |
| 12 | /TLOCK | O | Tracking servo feeding signal output<br>("L": Feed) |
| 13 | BLKCK | O | Sub-code block clock signal output (fBLKCK=75 Hz during normal playback) |
| 14 | SQCK | I | External clock signal input for sub-code Q register |
| 15 | SUBQ | O | Sub-code Q code output |
| 16 | DMUTE | I | Muting input ("H": Mute) |
| 17 | STAT | O | Status signal output<br>(CRC, CUE, CLVS, TTSTVP, FCLV, SQCK) |
| 18 | /RST | I | Reset input |
| 19 | SMCK | — | 1/2-divided clock signal of crystal oscillating at MSEL="H"<br>(fSMCK=8.4672 MHz)<br>1/4-divided clock signal of crystal oscillating at MSEL="L"<br>(fSMCK=4.2336 MHz) |
| 20 | PMCK | — | 1/192-divided clock signal of crystal oscillating (fPMCK=88.2 KHz)<br>(no use, open) |
| 21 | TRV | O | Traverse forced feed output |
| 22 | TVD | O | Traverse drive output |
| 23 | PC | O | Spindle motor ON signal output<br>("L": ON) |
| 24 | ECM | O | Spindle motor drive signal output<br>(forced mode output) |
| 25 | ECS | O | Spindle motor drive signal output<br>(servo error signal output) |
| 26 | KICK | O | Kick pulse output |
| 27 | TRD | O | Tracking drive output |
| 28 | FOD | O | Focus drive output |
| 29 | VREF | I | D/A (drive) output (TVD, ECS, TRD, FOD, FBAL, TBAL) Reference voltage input |
| 30 | FBAL | O | Focus balance adjustment output |
| 31 | TBAL | O | Tracking balance adjustment output |
| 32 | FE | I | Focus error signal input (analog input) |
| 33 | TE | I | Tracking error signal input<br>(analog input) |
| 34 | RFENV | I | RF envelope signal input |
| 35 | VDET | I | Vibration detection signal input<br>("H": detection) |
| 36 | OFT | I | Off-track signal input ("H": off track) |
| 37 | TRCRS | I | Track cross signal input |
| 38 | /RFDET | I | RF detection signal input<br>("L": detection) |
| 39 | BDO | I | Dropout signal input ("H": Dropout) |
| 40 | LDON | O | Laser on signal output ("H": ON) |
| 41 | TES | O | Tracking error shunt signal output<br>("H": shunt) |
| 42 | PLAY | O | Play signal out ("H": PLAY) |
| 43 | WVEL | O | Double speed status signal output<br>("H": Double speed) |
| 44 | ARF | I | RF signal input |
| 45 | IREF | I | Reference current input |
| 46 | DRF | — | DSL bias (no use, open) |
| 47 | DSLF | I/O | DSL loop filter |
| 48 | PLLF | I/O | PLL loop filter |
| 49 | VCOF | — | VCO loop filter (no use, open) |
| 50 | AVDD2 | I | Power supply input (for analog circuit) |
| 51 | AVss2 | — | GND (for analog circuit) |
| 52 | EFM | — | EFM signal output (not use, open) |
| 53 | PCK | — | PLL extraction clock output<br>(fPCK=4.321 MHz during normal playback) (no use, open) |
| 54 | PDO | — | Phase comparison signal of EFM and PCK signals (no use, open) |
| 55 | SUBC | O | Sub-code serial data output<br>(no use, open) |
| 56 | SBCK | I | Clock input for sub-code serial data<br>(no use, open) |
| 57 | Vss | — | GND |
| 58 | X1 | I | Crystal oscillating circuit input<br>(f=16.9344 MHz) |
| 59 | X2 | O | Crystal oscillation circuit output<br>(f=16.9344 MHz) |
| 60 | VDD | I | Power supply input<br>(for oscillating circuit) |
| 61 | BYTCK | — | Byte clock output (no use, open) |
| 62 | /CLDCK | O | Sub-code frame clock signal output (fCLDCK=7.35 kHz during normal playback) |
| 63 | FCLK | — | Crystal frame clock signal output<br>(fFCLK=7.35 kHz, double=14.7 kHz) |
| 64 | PFLAG | O | Interpolation flag output<br>("H": Interpolation) (no use, open) |
| 65 | FLAG | O | Flag output (no use, open) |
| 66 | CLVS | O | Spindle servo phase synchronizing signal output<br>("H": CLV, "L": rough servo)<br>(no use, open) |
| 67 | CRC | O | Sub-code CRC checked output<br>("H": OK, "L": NG) (no use, open) |
| 68 | DEMPH | O | De-emphasis ON signal output<br>("H": ON) (no use, open) |
| 69 | RESY | — | Frame resynchronizing signal output<br>(no use, open) |
| 70 | /RST2 | I | Reset input through MASH circuit<br>("L": Reset) |
| 71 | /TEST | I | Test input |
| 72 | AVDD1 | I | Power supply input (for analog circuit) |
| 73 | OUTL | O | Left channel audio signal output |
| 74 | AVss1 | — | GND |
| 75 | OUTR | O | Right channel audio signal output |
| 76 | RSEL | I | RF signal polarity assignment input (at "H" level, RSEL="H"; at "L" level, RSEL=L) |
| 77 | CSEL | — | Crystal oscillating frequency designation input<br>("L": 16.9344 MHz,<br>"H": 33.8688 MHz) |
| 78 | PSEL | — | Test input (normally, "L")<br>(no use, open) |
| 79 | MSEL | — | Output frequency switching for SMCK terminal<br>"H": SMCK=8.4672 MHz<br>"L": SMCK=4.2336 MHz<br>(no use, open) |
| 80 | SSEL | I | Output mode switching of SUBQ terminal ("H": Q code buffer mode) |

# ■ Replacement Parts List

**Notes:** •Important safety notice:
Components identified by △ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
•The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
•Warning: This product uses a diode. Refer to caution statements on page 2.
•The "(SF)" mark denotes the standard part.

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | INTEGRATED CIRCUIT(S) | |
| | | | |
| IC1 | LM2940T5 | IC, REGULATOR | ⚠ |
| IC401 | LC66304A4D86 | IC, SYSTEM CONTROL | |
| IC601 | M38112M4104F | IC, FL DRIVE/SYSTEM CONT. | |
| IC602 | LA5608M-TE-L | IC, BUS LINE/HALT/RESET | |
| IC701 | AN8802SCE1V | IC, SERVO AMP. | |
| IC702 | MN66271RA | IC, SERVO PROCESSOR | |
| IC703 | AN8389SE1 | IC, MOTOR DRIVE | |
| IC790 | TA7291S | IC, MOTOR DRIVE | |
| IC801 | XRA4558FT1 | IC, L. P. F. | |
| IC802 | TC4066BFTP1 | IC, SWITCHING | |
| | | | |
| | | TRANSISTOR(S) | |
| | | | |
| Q1, 2 | 2SD2137PQTA | TRANSISTOR | ⚠ |
| Q4 | 2SD2137PQTA | TRANSISTOR | ⚠ |
| Q5 | 2SB1238QRTV6 | TRANSISTOR | ⚠ |
| Q701 | 2SB709S | TRANSISTOR | |
| Q801 | UN4112 | TRANSISTOR | |
| | | | |
| | | DIODE(S) | |
| | | | |
| D1, 2 | RL1N4003N02 | DIODE | ⚠ |
| D3 | RL1N4003N02 | DIODE | |
| D4 | MA4082LTA | DIODE | ⚠ |
| D5, 6 | MA167 | DIODE | ⚠ |
| D7, 8 | MA165 | DIODE | |
| D9 | MA4051MTA | DIODE | ⚠ |
| D11, 12 | MA185TA | DIODE | ⚠ |
| D13 | MA4270HTA | DIODE | ⚠ |
| D15 | MA4051MTA | DIODE | ⚠ |
| D16 | MA185TA | DIODE | ⚠ |
| D602-604 | MA165 | DIODE | |
| D606 | SPR-305MDTF | LED | |
| D608, 609 | MA165 | DIODE | |
| D610 | MA4051MTA | DIODE | ⚠ |
| | | | |
| | | COIL(S) | |
| | | | |
| L1, 2 | BL02RN2R65T2 | COIL | ⚠ |
| L3, 4 | ELEXT3R3KA9 | COIL | |
| L601 | RLQA100JT-Y | COIL | |
| | | | |
| | | OSCILLATOR(S) | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| X401 | EF0EC4234T3 | OSCILLATOR(4.23MHz) | |
| X601 | EF0EC4234T3 | OSCILLATOR(4.23MHz) | |
| X701 | RSXB16M9J01T | OSCILLATOR(16.9344MHz) | |
| | | | |
| | | DISPLAY TUBE | |
| | | | |
| FL601 | RSL0185-F | DISPLAY TUBE | |
| | | | |
| | | SWITCH(ES) | |
| | | | |
| S601 | EVQ21405R | SW, R. SKIP/R. SEARCH | |
| S602 | EVQ21405R | SW, F. SKIP/F. SEARCH | |
| S603 | EVQ21405R | SW, REPEAT | |
| S604 | EVQ21405R | SW, RANDOM | |
| S605 | EVQ21405R | SW, LAST FADE | |
| S606 | EVQ21405R | SW, JUST FIT | |
| S607 | EVQ21405R | SW, ALBUM | |
| S608 | EVQ21405R | SW, TRAY OPEN/CLOSE | |
| S611 | EVQ21405R | SW, STOP | |
| S612 | EVQ21405R | SW, PAUSE | |
| S613 | EVQ21405R | SW, PLAY | |
| S701 | RSM0006-P | SW, REST | |
| S790 | RSH1A005 | SW, LOADING CLOSE DETECT | |
| S791 | RSH1A005 | SW, LOADING OPEN DETECT | |
| | | | |
| | | CONNECTOR(S) | |
| | | | |
| CN401 | RJP6G18ZA | CONNECTOR(6P) | |
| CN402 | RJS1A6823 | SOCKET(23P) | |
| CN601 | RJS1A6814 | SOCKET(14P) | |
| CN701 | RJU035T016-1 | SOCKET(16P) | |
| CN702 | RJS1A6723-1Q | SOCKET(23P) | |
| CP601 | RJS1A6714 | SOCKET(14P) | |
| CP790 | RJP6G17ZA | CONNECTOR(6P) | |
| | | | |
| | | GND PLATE | |
| E1 | SNE1004-2 | GND PLATE | |
| | | | |
| | | JACK | |
| JK801 | RJT065K15 | SYSTEM CONNECTOR | |
| | | | |
| | | TEST JUMPER(S) | |
| TJ701, 702 | EYF8CU | TEST JUMPER | |
| | | | |
| | | | |

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| | | |
| | | RESISTORS |
| | | |
| R1 | ERQ16NKWR15E | 1/6W 0.15 ⚠ |
| R2 | ERDS1FVJ271T | 1/2W 270 ⚠ |
| R3 | ERD2FCVJ6R8T | 1/4W 6.8 ⚠ |
| R4, 5 | ERDS2TJ1R2 | 1/4W 1.2 |
| R7 | ERDS2TJ1R2 | 1/4W 1.2 |
| R8 | ERDS2TJ220T | 1/4W 22 |
| R9 | ERDS2TJ562 | 1/4W 5.6K |
| R10 | ERDS2TJ562 | 1/4W 5.6K |
| R11 | ERDS2TJ472 | 1/4W 4.7K |
| R13 | ERD2FCVJ4R7T | 1/4W 4.7 ⚠ |
| R14, 15 | ERG1SJ150E | 1W 15 |
| R16 | ERD2FCVJ4R7T | 1/4W 4.7 ⚠ |
| R17, 18 | ERG1SJ150E | 1W 15 |
| R19, 20 | ERDS2TJ100 | 1/4W 10 |
| R21 | ERG1SJ180E | 1W 18 |
| R22 | ERDS2TJ562 | 1/4W 5.6K |
| R23 | ERDS2TJ471 | 1/4W 470 |
| R26, 27 | ERDS2TJ271 | 1/4W 270 |
| R28 | ERDS2TJ101 | 1/4W 100 |
| R31-36 | ERDS2TJ100 | 1/4W 10 |
| R402, 403 | ERDS2TJ102 | 1/4W 1K |
| R404-407 | ERDS2TJ152 | 1/4W 1.5K |
| R408 | ERDS2TJ104 | 1/4W 100K |
| R409, 410 | ERDS2TJ103 | 1/4W 10K |
| R411 | ERDS2TJ472 | 1/4W 4.7K |
| R412 | ERDS2TJ102 | 1/4W 1K |
| R413 | ERDS2TJ472 | 1/4W 4.7K |
| R414 | ERDS2TJ102 | 1/4W 1K |
| R415 | ERDS2TJ105T | 1/4W 1M |
| R421 | ERDS2TJ223 | 1/4W 22K |
| R427 | ERDS2TJ103 | 1/4W 10K |
| R428 | ERDS2TJ223 | 1/4W 22K |
| R429 | ERDS2TJ102 | 1/4W 1K |
| R601-604 | ERDS2TJ473 | 1/4W 47K |
| R605 | ERDS2TJ101 | 1/4W 100 |
| R606 | ERDS2TJ104 | 1/4W 100K |
| R607 | ERDS2TJ103 | 1/4W 10K |
| R608, 609 | ERDS2TJ102 | 1/4W 1K |
| R610-613 | ERDS2TJ101 | 1/4W 100 |
| R614, 615 | ERDS2EJ121 | 1/4W 120 |
| R616 | ERDS2TJ104 | 1/4W 100K |
| R618, 619 | ERDS2TJ151 | 1/4W 150 |
| R620, 621 | ERDS2TJ1R2 | 1/4W 1.2 |
| R632, 633 | ERDS2TJ472 | 1/4W 4.7K |
| R637 | ERDS2TJ470 | 1/4W 47 |
| R701 | ERJ6GEYJ100 | 1/10W 10 |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| R702 | ERJ6GEYJ471V | 1/10W 470 |
| R703 | ERJ6GEYJ823 | 1/10W 82K |
| R704 | ERJ6GEYJ102A | 1/10W 1K |
| R705 | ERJ6GEYJ103V | 1/10W 10K |
| R706 | ERJ6GEYJ102A | 1/10W 1K |
| R707 | ERJ6GEYJ473V | 1/10W 47K |
| R708 | ERJ6GEYJ104V | 1/10W 100K |
| R709 | ERJ6GEYJ683V | 1/10W 68K |
| R711 | ERJ6GEYJ154V | 1/10W 150K |
| R712 | ERJ6GEYJ221V | 1/10W 220 |
| R714 | ERJ6GEYJ121V | 1/10W 120 |
| R717, 718 | ERJ6GEYJ102A | 1/10W 1K |
| R721 | ERJ6GEYJ101V | 1/10W 100 |
| R722 | ERJ6GEYJ563V | 1/10W 56K |
| R723 | ERJ6GEYJ182V | 1/10W 1.8K |
| R724 | ERJ6GEYJ333V | 1/10W 33K |
| R725 | ERJ6GEYJ472V | 1/10W 4.7K |
| R726 | ERJ6GEYJ473V | 1/10W 47K |
| R727 | ERJ6GEYJ103V | 1/10W 10K |
| R728 | ERJ6GEYJ392V | 1/10W 3.9K |
| R731 | ERJ6GEYJ392V | 1/10W 3.9K |
| R735, 736 | ERJ6GEYJ101V | 1/10W 100 |
| R744 | ERJ6GEYJ103V | 1/10W 10K |
| R745 | ERJ6GEYJ155V | 1/10W 1.5M |
| R748 | ERJ6GEYJ182V | 1/10W 1.8K |
| R749 | ERJ8GEYJ103V | 1/8W 10K |
| R801, 802 | ERDS2TJ102 | 1/4W 1K |
| R803, 804 | ERDS2TJ104 | 1/4W 100K |
| R805-808 | ERDS2TJ223 | 1/4W 22K |
| R809, 810 | ERDS2TJ273 | 1/4W 27K |
| R811, 812 | ERDS2TJ332 | 1/4W 3.3K |
| R813, 814 | ERDS2TJ104 | 1/4W 100K |
| R815, 816 | ERDS2TJ102 | 1/4W 1K |
| R817, 818 | ERDS2TJ104 | 1/4W 100K |
| R819 | ERDS2TJ103 | 1/4W 10K |
| | | |
| | | CHIP JUMPER(S) |
| | | |
| J701, 702 | ERJ8GEY0R00A | 1/8W 0 |
| J707-709 | ERJ8GEY0R00A | 1/8W 0 |
| J714 | ERJ8GEY0R00A | 1/8W 0 |
| J716-718 | ERJ8GEY0R00A | 1/8W 0 |
| J721 | ERJ6GEY0R00A | 1/10W 0 |
| J724-726 | ERJ6GEY0R00A | 1/10W 0 |
| J728, 729 | ERJ8GEY0R00A | 1/8W 0 |
| J731, 732 | ERJ6GEY0R00A | 1/10W 0 |
| | | |
| | | CAPACITORS |
| | | |

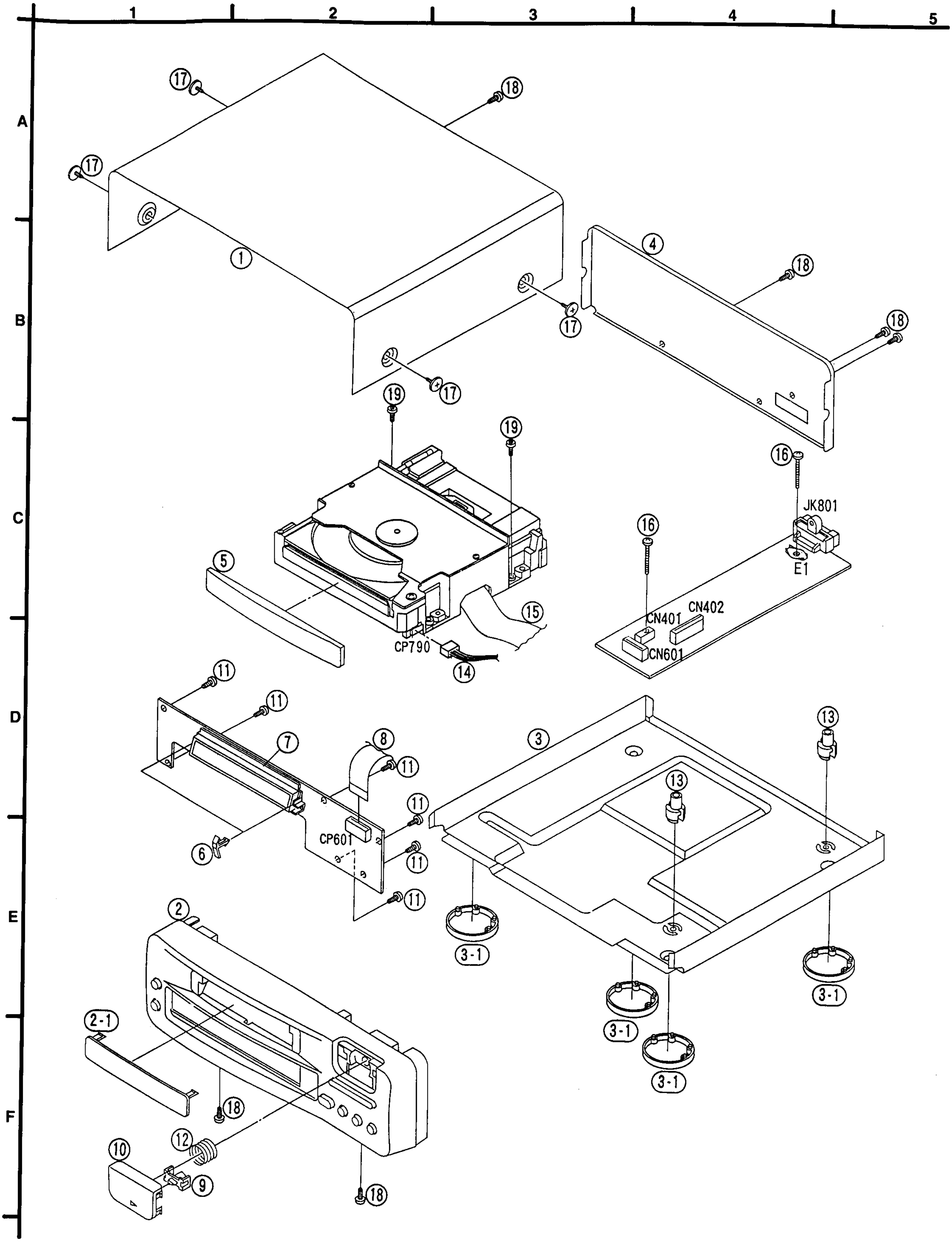
| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| C1, 2 | ECBT1E103ZF | 25V 0.01U |
| C3 | ECA1CM222B | 16V 2200U ⚠ |
| C4 | ECEA1AKA101B | 10V 100U |
| C5 | ECBT1H102KB5 | 50V 1000P |
| C6 | ECEA1AKA221B | 10V 220U |
| C7 | RCE0JKA221BV | 6.3V 220U |
| C8, 9 | ECA1VFQ121B | 35V 120U |
| C10 | ECA1EM101B | 25V 100U ⚠ |
| C11, 12 | ECA1HM470B | 50V 47U |
| C13 | ECBT1H102KB5 | 50V 1000P |
| C401 | ECBT1E103ZF | 25V 0.01U |
| C402 | ECBT1H104ZF5 | 50V 0.1U |
| C403 | ECBT1H102KB5 | 50V 1000P |
| C404 | ECBT1E103ZF | 25V 0.01U |
| C601 | ECBT1H104ZF5 | 50V 0.1U |
| C602, 603 | ECEA1HKA3R3B | 50V 3.3U |
| C604 | ECEA0JKA470B | 6.3V 47U |
| C605 | ECBT1H102KB5 | 50V 1000P |
| C606 | ECBT1E103ZF | 25V 0.01U |
| C608 | ECBT1E103ZF | 25V 0.01U |
| C610 | ECEA1HKAR22B | 50V 0.22U |
| C611 | ECEA1HKAR33B | 50V 0.33U |
| C612 | ECBT1E223ZF | 25V 0.022U |
| C613 | ECBT1E103ZF | 25V 0.01U |
| C701 | ECEA0JKA220 | 6.3V 22U |
| C702 | ECEA1HKA010I | 50V 1U |
| C703 | ECEA0JKA101I | 6.3V 100U |
| C704 | ECUZ1E104MBN | 25V 0.1U |
| C705 | ECEA1HKA010I | 50V 1U |
| C706 | ECUE1H101JCN | 50V 100P |
| C707 | ECUV1E273KBN | 25V 0.027U |
| C708 | ECUE1H472KBN | 50V 4700P |
| C709 | ECUE1C473KBN | 16V 0.047U |
| C710 | ECUE1H152KBN | 50V 1500P |
| C711, 712 | ECUZ1E104MBN | 25V 0.1U |
| C713 | ECUV1C104MBM | 16V 0.1U |
| C714 | ECEA0JKA101I | 6.3V 100U |
| C715 | ECEA0JKA470I | 6.3V 47U |
| C716 | ECUE1H561KBN | 50V 560P |
| C717 | ECUZ1E104MBN | 25V 0.1U |
| C718 | ECUV1C224KBM | 16V 0.22U |
| C721 | ECUV1H070DCN | 50V 7P |
| C722 | ECUV1H220JCN | 50V 22P |
| C723 | ECEA1AKA221I | 10V 220U |
| C724 | ECUV1C104MBM | 16V 0.1U |
| C725, 726 | ECUV1H102JCN | 50V 1000P |
| C727, 728 | ECEA1HPK010I | 50V 1U |
| C730 | ECUZ1E104MBN | 25V 0.1U |
| C731, 732 | ECEA0JK221I | 6.3V 220U |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| C733 | ECUZ1E104MBN | 25V 0.1U |
| C734 | ECEA1AKA221I | 10V 220U |
| C735-737 | ECUZNE104MBN | 25V 0.1U |
| C738 | ECUV1C154KBN | 16V 0.15U |
| C742 | ECUV1E273KBN | 25V 0.027U |
| C743 | ECUZNE104MBN | 25V 0.1U |
| C744 | ECUE1E822KBN | 25V 8200P |
| C745 | ECUE1H102KBN | 50V 1000P |
| C747 | ECUE1H222KBN | 50V 2200P |
| C748 | ECUV1H471KBM | 50V 470P |
| C790 | ECA1AKF820E | 10V 82U |
| C803, 804 | ECBT1H102KB5 | 50V 1000P |
| C807, 808 | ECBT1H331KB5 | 50V 330P |
| C809, 810 | ECBT1H121KB5 | 50V 120P |
| C811, 812 | ECEA0JKA470B | 6.3V 47U |
| C813, 814 | ECEA1AKA220B | 10V 22U |
| C815, 816 | ECBT1H101KB5 | 50V 100P |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | CABINET PARTS | |
| | | | |
| 1 | RKM0266-K | CABINET | |
| 2 | RFKGLCH510EK | FRONT PANEL ASS'Y | |
| 2-1 | RKW0346-V | FL PANEL | |
| 3 | RFKJLCA1060E | BOTTOM BOARD ASS'Y | |
| 3-1 | RKA0011-3 | FOOT | |
| 4 | RGR0195A-A | REAR PANEL | |
| 5 | RGK0648-K | TRAY PANEL | |
| 6 | RMN0195 | FL SPACER | |
| 7 | RMN0276 | FL HOLDER | |
| 8 | RWJ5414120EE | FPC(14P) | |
| 9 | RGL0238-Q | LEADING LIGHT PANEL | |
| 10 | RGU1075-K | MAIN BUTTON | |
| 11 | XTBS26+8J | SCREW | |
| 12 | RMB0370 | SPRING | |
| 13 | SHE185-2 | P. C. B. SPACER | |
| 14 | REX0510 | LEAD CABLE(6P) | |
| 15 | REZ0537 | FPC(23P) | |
| 16 | XTB3+16JFZ | SCREW | |
| 17 | RHD30007 | SCREW | |
| 18 | XTBS3+8JFZ1 | SCREW | |
| 19 | XTB3+8FFZ | SCREW | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | LOADING UNIT PARTS | |
| | | | |
| 101 | RFKJLCH505BK | CHASSIS ASS'Y | |
| 101A | RDG0142 | LOADING GEAR | |
| 101B | RDG0193 | LOADING GEAR(1) | |
| 101C | RDP0065 | PULLEY | |
| 102 | REM0019 | MOTOR ASS'Y | |
| 103 | RMA0339 | HOLDER | |
| 104 | RME0063 | LOCK LEVER SPRING | |
| 105 | RME0087 | SPRING | |
| 106 | RMG0158 | BELT | |
| 107 | RML0177 | CONVERSION LEVER | |
| 108 | RML0178-1 | LOCK LEVER | |
| 109 | RMM0059-1 | SLIDE PLATE(2) | |
| 110 | RMM0079 | SLIDE PLATE(1) | |
| 111 | XTN26+6G | SCREW | |
| 112 | XYN2+F6FZ | SCREW | |
| 113 | RDB0036 | GUIDE HOLDER | |
| 114 | RHD20010 | SCREW | |
| 115 | RMU0046 | GUIDE SHAFT | |
| 116 | RHM245ZA | MAGNET | |
| 117 | RFKNACH350EK | DISC CLAMPER ASS'Y | |
| 118 | RMR0334 | MAGNET HOLDER | |
| 119 | RXQ0123 | DISC HOLDE | |
| 120 | RFKNLPG440-K | DRIVE RUCK ASS'Y | |
| 121 | RGQ0088-K1 | DISC TRAY | |
| 122 | RHD20009-1 | SCREW | |
| 123 | XTB3+25GFZ | SCREW | |
| 124 | XTN26+6G | SCREW | |
| 125 | XTN3+8JFZ | SCREW | |
| 126 | RAE0113Z | TRAVERSE UNIT ASS'Y | |
| 126A | SHGD112 | RUBBER | |
| 126B | SHGD113-1 | RUBBER | |
| 126C | XQS17+A35FZ | SCREW | |
| 127 | RME0109 | SPRING(A) | |
| 128 | RMS0123-1 | PIN(A) | |
| 129 | RMS0350 | PIN(B) | |
| 130 | RMR0698-K | TRAVERSE CHASSIS | |
| 131 | XTV2+6G | SCREW | |
| 132 | RME0142 | SPRING(B) | |

# Cabinet Parts Location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JK801
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E1
⑤
⑮
CN401
CN402
CN601
CP790
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CP601
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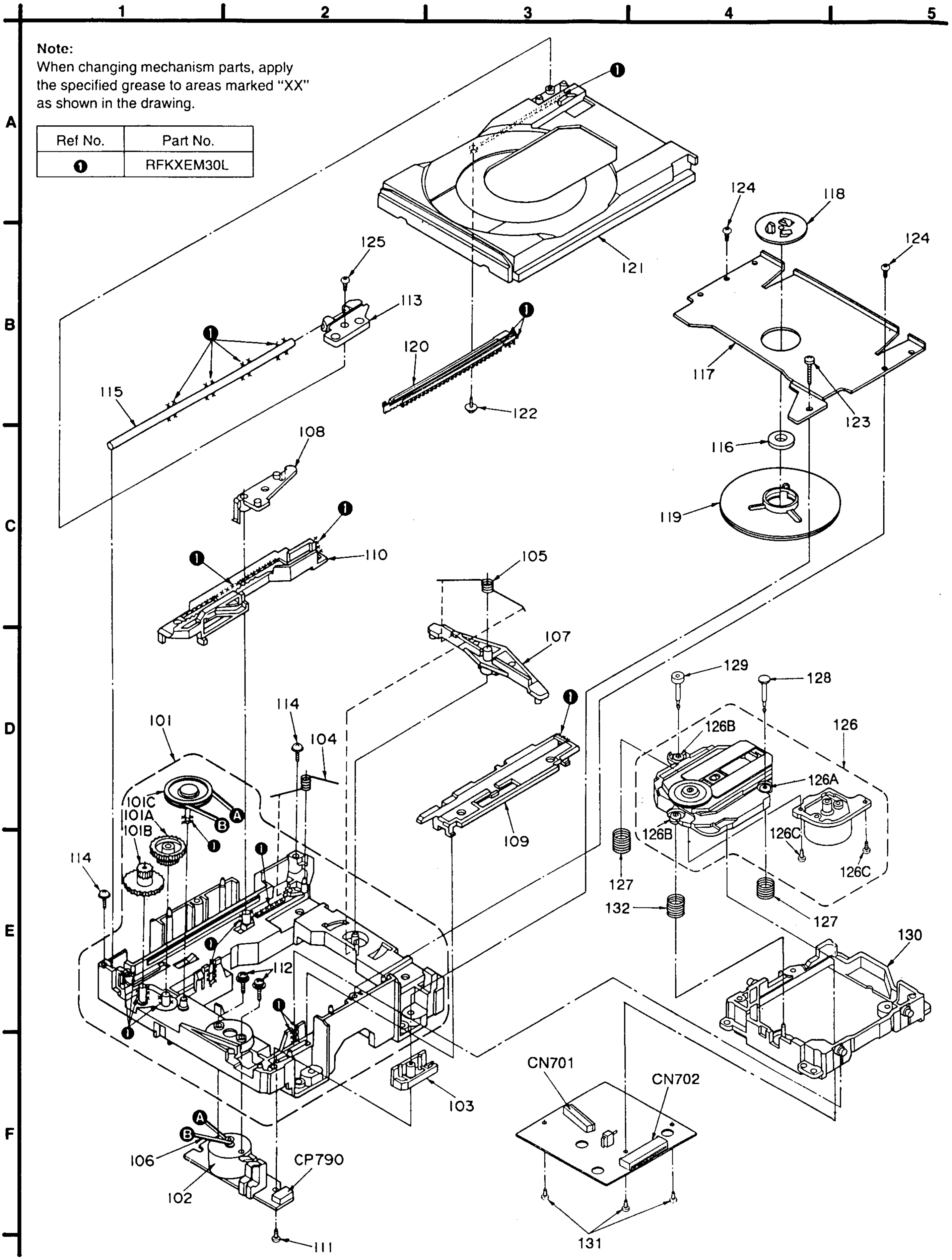
⑪
②
3-1
3-1
3-1
3-1
2-1
⑱
⑫
⑩
⑨
⑱

# ■ Loading Unit Parts Location

**Note:**
When changing mechanism parts, apply the specified grease to areas marked "XX" as shown in the drawing.

| Ref No. | Part No. |
|---|---|
| ❶ | RFKXEM30L |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❶
110
105
107
129
128
114
104
101
❶
126B
126
126A
101C
101A
101B
Ⓐ
Ⓑ
❶
❶
109
126B
126C
114
127
126C
132
127
130
❶
112
❶
❶
103
CN701
CN702
Ⓐ
Ⓑ
106
CP790
102
131
111

Printed in Japan
F940712000 TW/HH/TN

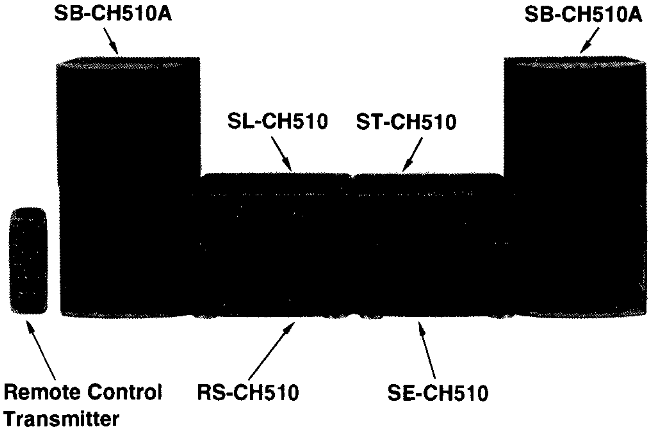
ORDER NO. AD9407189C8

# Service Manual

Cassette Deck

# RS-CH510

*1 DOLBY B NR



**Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.**

**Colour**

(K) ................ Black Type

**Area**

| Suffix for Model No. | Area | Colour |
|---|---|---|
| (E) | Europe, Asia, Latin America, Middle Near East and Africa and Oceania | (K) |

## System: SC-CH510

*1 : Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"Dolby" and the double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

## AR-1 MECHANISM SERIES

## Specifications

| | |
|---|---|
| **Deck system** | Stereo cassette deck |
| **Track system** | 4 track, 2 channel |
| **Recording system** | AC bias |
| **Bias frequency** | 80 kHz |
| **Erasing system** | AC erase |
| **Heads** | |
| **Deck 1 (Playback head)** | Permalloy head |
| **Deck 2 (Recording/Playback head)** | Permalloy head |
| **(Erasing head)** | Double gap ferrite head |
| **Motors** | |
| **Deck 1, 2** | |
| **Capstan drive** | DC servo motor |
| **Reel table drive** | DC motor |
| **Tape speed** | 4.8 cm/sec |
| **Wow and flutter** | 0.1% (WRMS) |
| **Fast forward and rewind times** | Approx. 50 seconds with C-60 cassette tape |

| | |
|---|---|
| **Frequency response** | |
| **(Dolby NR off, CCRT on)** | |
| **NORMAL** | 20 Hz – 17 kHz |
| | 30 Hz – 15 kHz (DIN) |
| **$CrO_2$** | 20 Hz – 18 kHz |
| | 30 Hz – 17 kHz (DIN) |
| **METAL** | 20 Hz – 20 kHz |
| | 30 Hz – 19 kHz (DIN) |
| **S/N (Signal level = max recording level, $CrO_2$)** | |
| **NR off** | 56 dB (A weighted) |
| **Dolby NR on** | 66 dB (CCIR) |
| **Input sensitivity and impedance** | |
| **LINE IN** | 126 mV/17.6 kΩ |
| **Output voltage and impedance** | |
| **LINE OUT** | 400 mV/220 Ω |

### ■ General

| | |
|---|---|
| **Dimensions (W × H × D)** | 270 × 118.5 × 263 mm |
| **Weight** | 2.85 kg |

**Notes:**
Specifications are subject to change without notice.
Weight and dimensions are approximate.

| System | Tuner/sound processor | Compact disc player | Amplifier | **Cassette Deck** | Speakers |
|---|---|---|---|---|---|
| SC-CH510 | ST-CH510 | SL-CH510 | SE-CH510 | **RS-CH510** | *2 SB-CH510A |

**Technics**®

*2: For Europe ................... Made in PAES
For other areas ............ Made in NABEL

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- Operation Check and Main Component Replacement Procedures .......... 3~8
- Measurements and Adjustments .......... 9~13
- Schematic Diagram .......... 14~20
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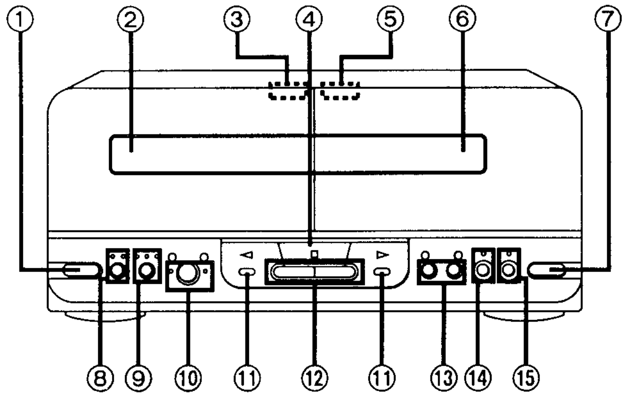
- Mechanism Parts Location .......... 39~42

**NOTE:**
**Refer to the service manual for Model No. SE-CH510 (ORDER No. AD9407197C8) for information on "Accessories", "Stacking the Components", "Connections" and "Packaging".**

## ■ Location of Controls

① **Deck 1 holder open button**
② **Deck 1 cassette holder**
③ **Deck 1 holder close button**
④ **Stop button**
⑤ **Deck 2 holder close button**
⑥ **Deck 2 cassette holder**
⑦ **Deck 2 holder open button**
⑧ **Dolby noise reduction button and indicators**
⑨ **Reverse mode button and indicators**
⑩ **Deck 1/deck 2 select button and indicators**
⑪ **Playback buttons and indicators**
⑫ **Fast forward/rewind/tape program sensor buttons**
⑬ **One-touch tape edit buttons**
⑭ **Record pause button and indicator**
⑮ **CCRT button and indicator**



## ■ Operation Check and Main Component Replacement Procedures

**NOTE**

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Illustrated screws are equivalent to actual size.**
5. **Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.**

### • Contents

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  - 2.Checking for the main P.C.B. .......... 4.
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- **Main Component Replacement Procedures**
  - 1.Replacement for the head block and pinch roller unit .......... 5, 6.
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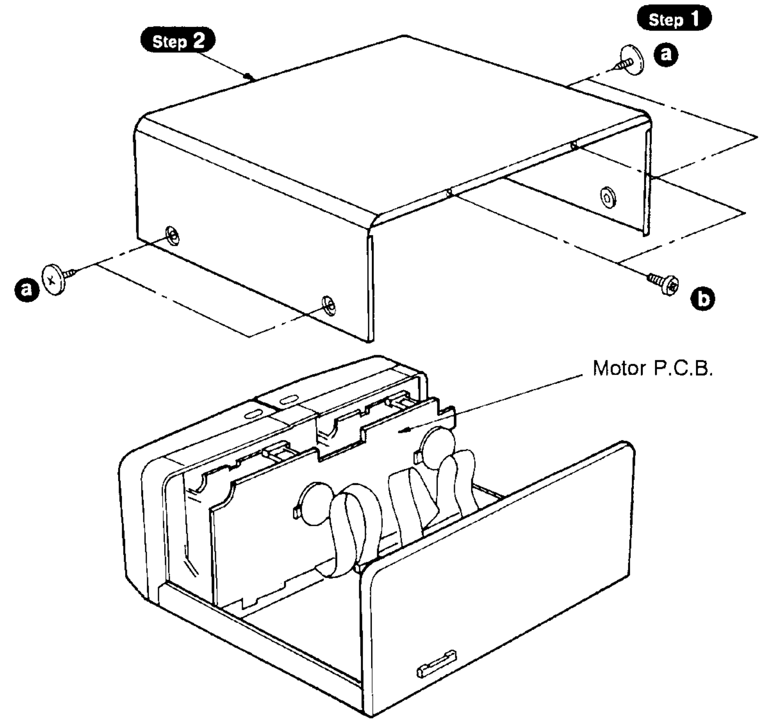
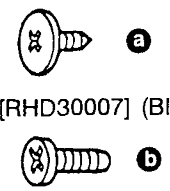
## ■ Checking Procedure for each P.C.B.

### 1. Checking for the motor P.C.B.

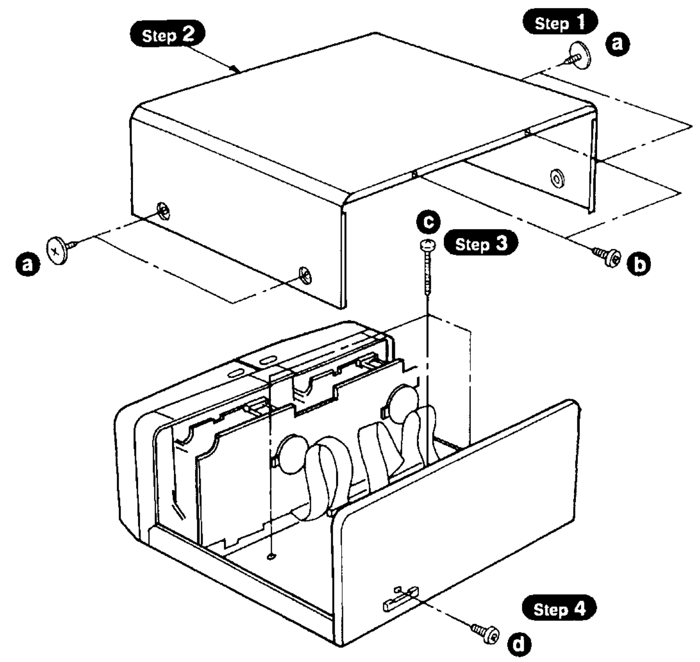


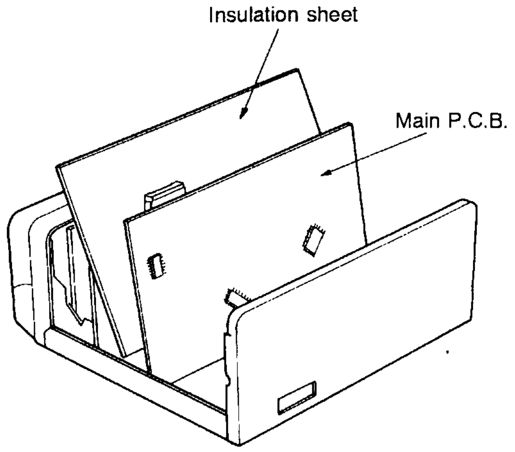


[RHD30007] (Black)

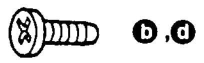
[XTBS3+8JFZ1] (Black)

## 2. Checking for the main P.C.B.


Step 2
Step 1
a
c
Step 3
b
a
Step 4
d

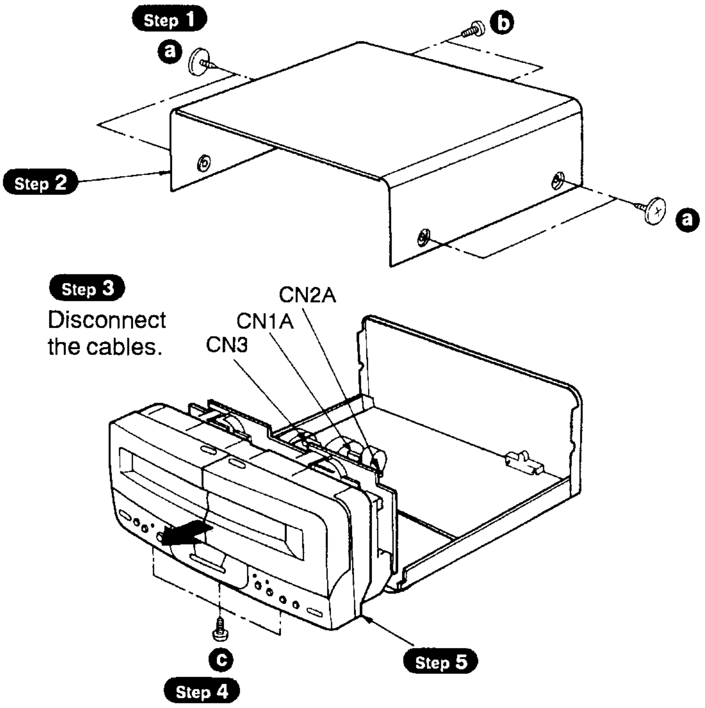

Insulation sheet
Main P.C.B.

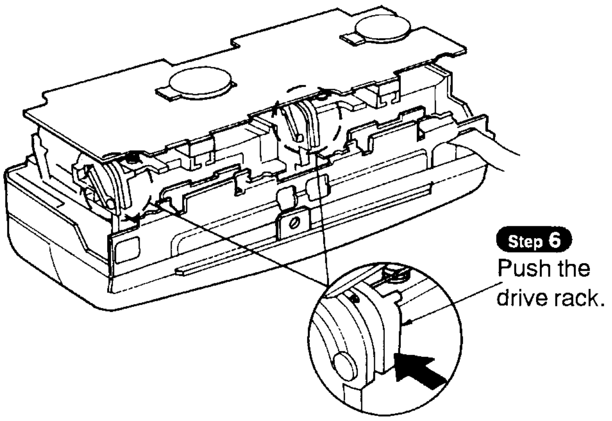
[RHD30007] (Black)　[XTB3+16JFZ] (Black)



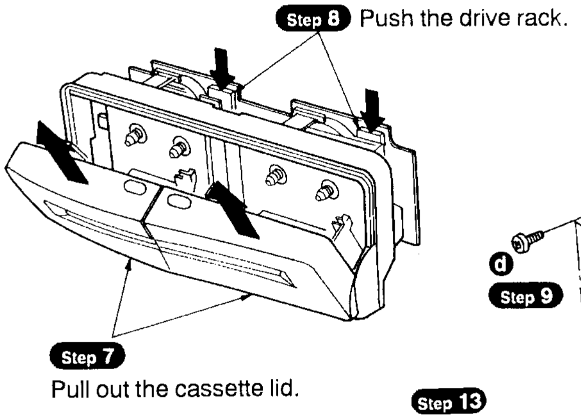
[XTBS3+8JFZ1] (Black)

## 3. Checking for the operation P.C.B.


Step 1
a
b
Step 2
a
Step 3
Disconnect the cables.
CN2A
CN1A
CN3
c
Step 4
Step 5

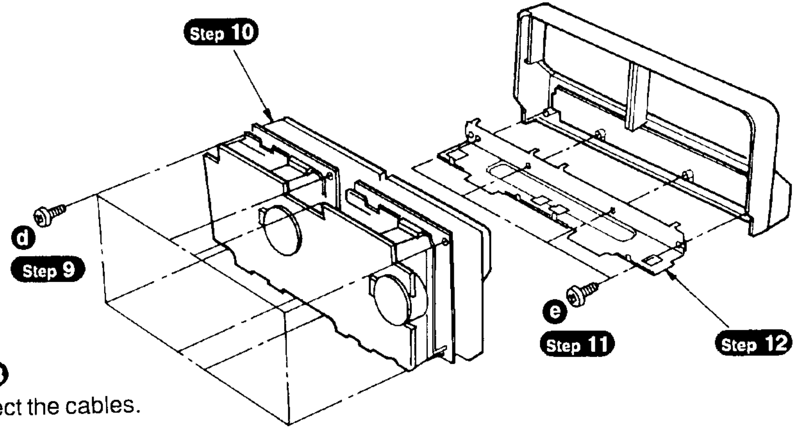

Step 6
Push the drive rack.

[RHD30007] (Black)　[XTBS3+8JFZ1] (Black)

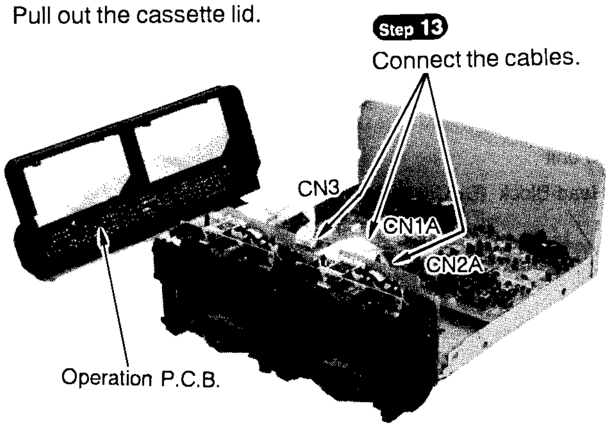


Step 8 Push the drive rack.

Step 7 Pull out the cassette lid.

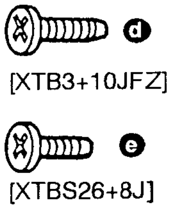


Step 10
d
Step 9
e
Step 11
Step 12



Step 13 Connect the cables.

CN3
CN1A
CN2A
Operation P.C.B.

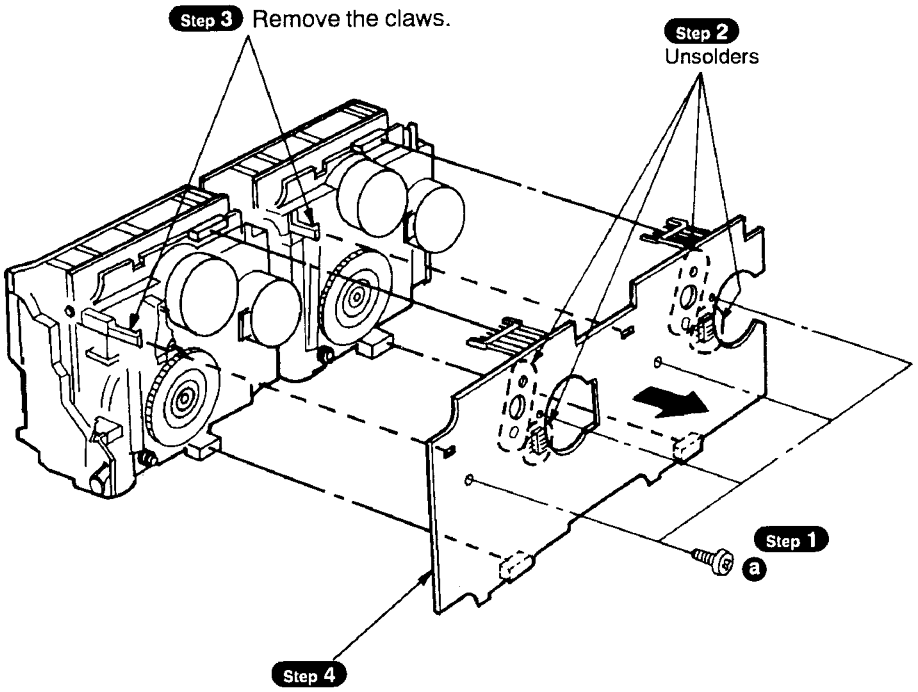


d
[XTB3+10JFZ]
e
[XTBS26+8J]

## ■ Main Component Replacement Procedures

### 1. Replacement for the head block and pinch roller unit

- Follow the Step 1 ~ Step 10 of the item 3 in checking procedure for each P.C.B. on page 4, 5.

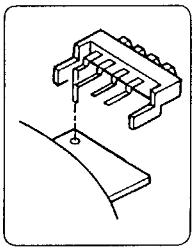


Step 3 Remove the claws.

Step 2 Unsolders

Step 1

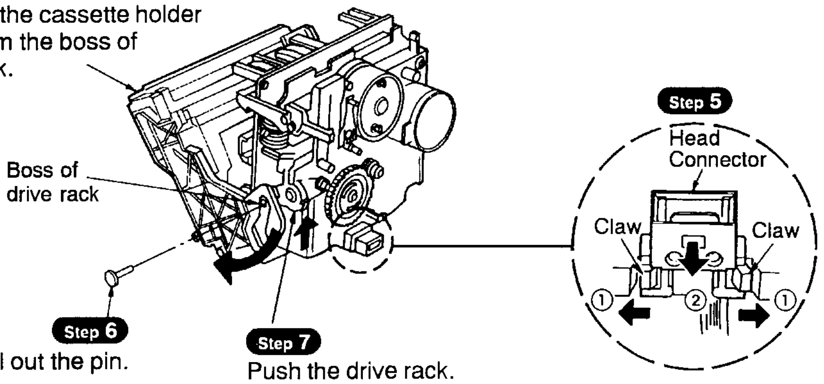
Step 4



**NOTE**

Handle the connector with care so that the shape of terminal is different from others.

[XTW2+5L]

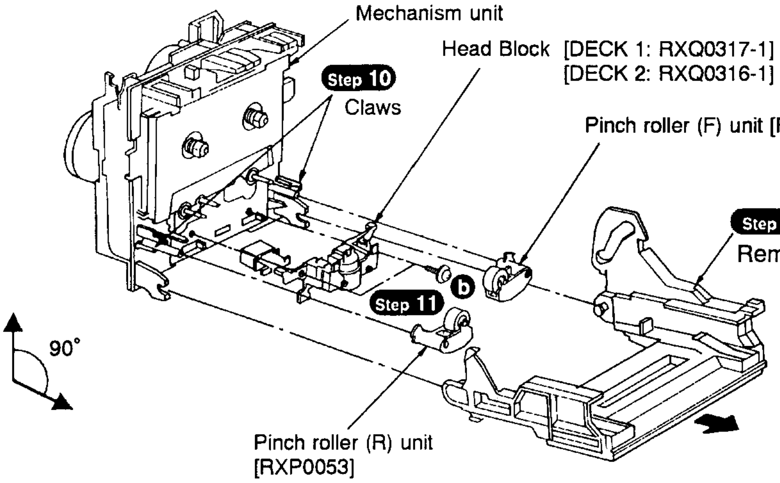

Boss of drive rack
Head Connector
Claw
Claw
①
②
①

**Step 8** Remove the cassette holder ass'y from the boss of drive rack.

**Step 5**

**Step 6** Pull out the pin.

**Step 7** Push the drive rack.


Mechanism unit
Head Block [DECK 1: RXQ0317-1]
[DECK 2: RXQ0316-1]
Claws
Pinch roller (F) unit [RXP0052]
b
90°
Pinch roller (R) unit
[RXP0053]

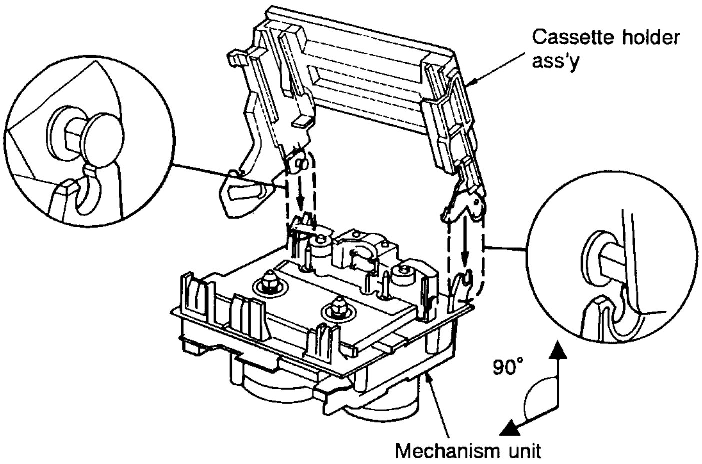
**Step 10** Claws

**Step 9** Remove the cassette holder ass'y.

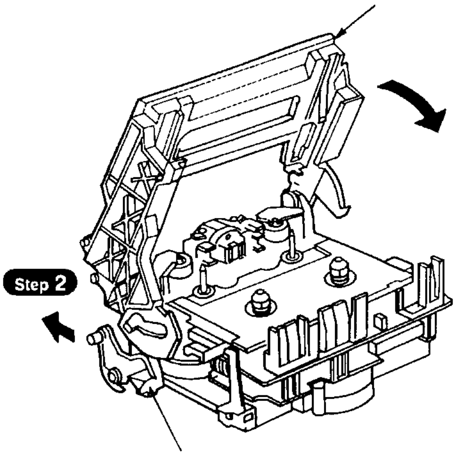
**Step 11**

## Installation of the cassette holder ass'y after replacement

**Step 1** Locate the cassette holder ass'y and mechanism unit at a 90 degree angle, and then install the cassette holder ass'y.


Cassette holder ass'y
90°
Mechanism unit

**Step 3** Close the cassette holder ass'y.

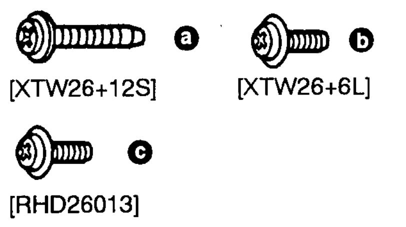


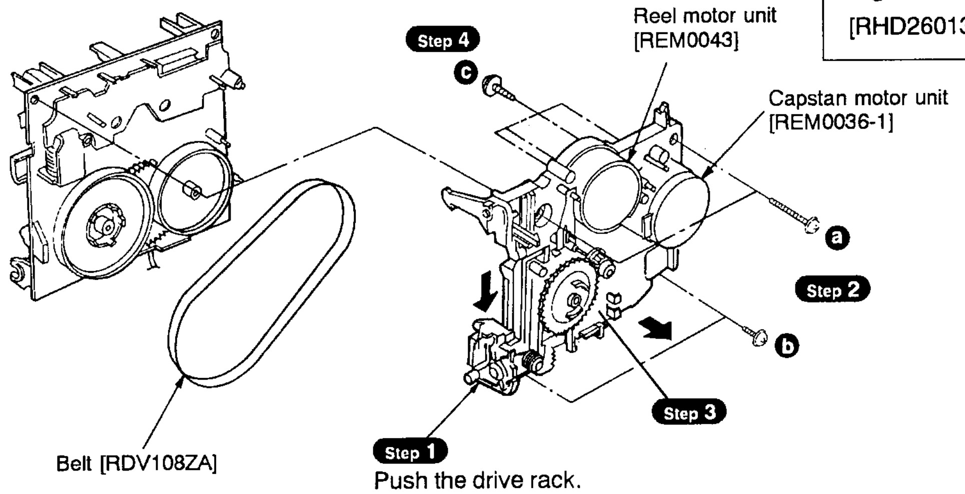
**Step 2**

Force this point of drive rack.

## 2. Replacement for the belt, reel motor unit and capstan motor unit

- Follow the Step 1 ~ Step 8 of item 1 in main component replacement procedures on page 5, 6.


a
b
[XTW26+12S]
[XTW26+6L]
c
[RHD26013]

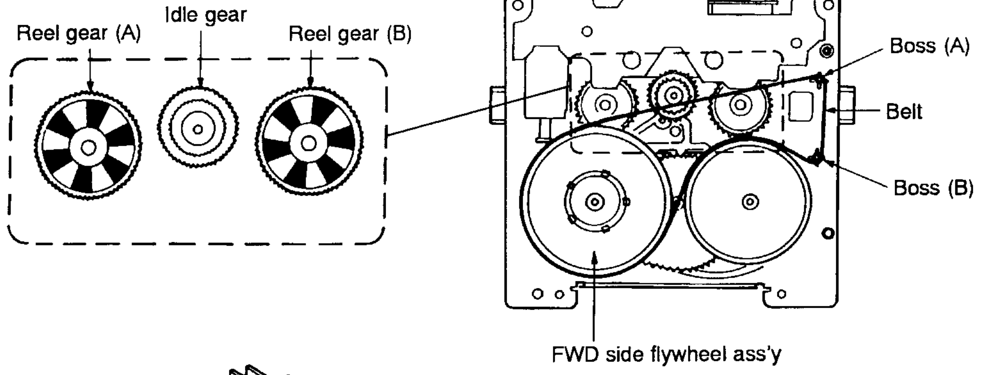

Step 4
c
Reel motor unit
[REM0043]
Capstan motor unit
[REM0036-1]
a
Step 2
b
Step 3
Belt [RDV108ZA]
Step 1

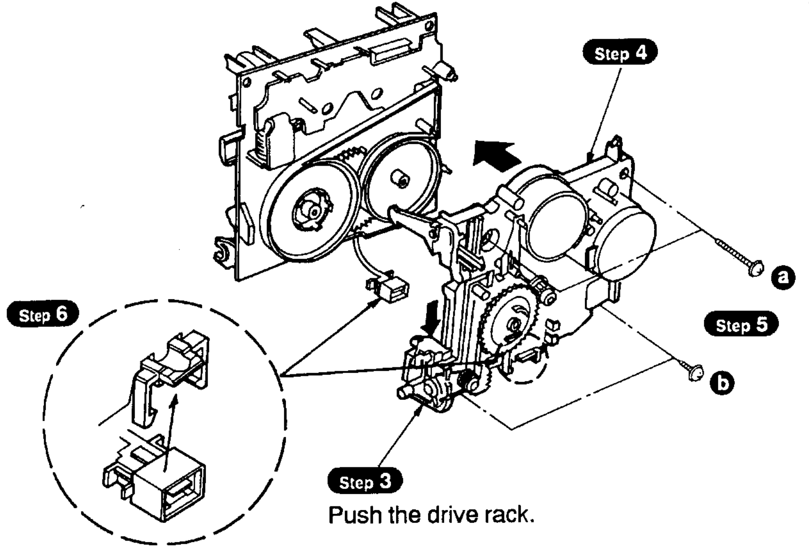
Step 1 Push the drive rack.

### Installation of the sub chassis ass'y after replacement

Step 1 Place the idle gear in the center.

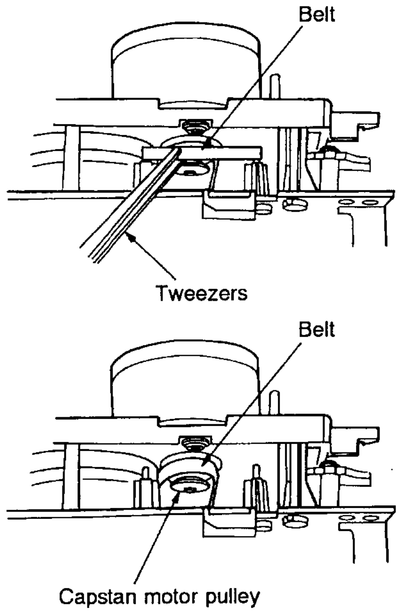
Step 2 Temporarily secure the belt.

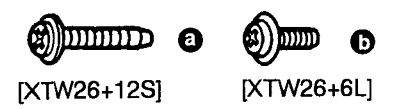

Idle gear
Reel gear (A)
Reel gear (B)
Boss (A)
Belt
Boss (B)
FWD side flywheel ass'y


Step 4
a
Step 5
b
Step 6
Step 3

Step 3 Push the drive rack.

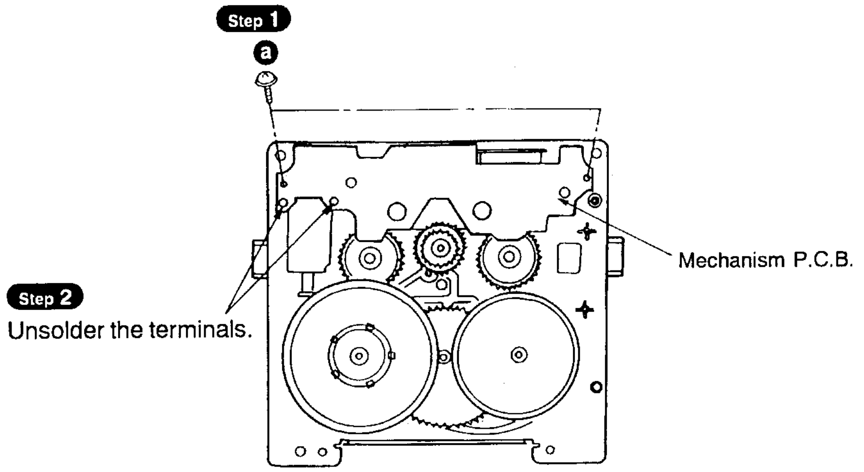
Step 7 Secure the belt with the capstan motor pulley.


Belt
Tweezers
Belt
Capstan motor pulley

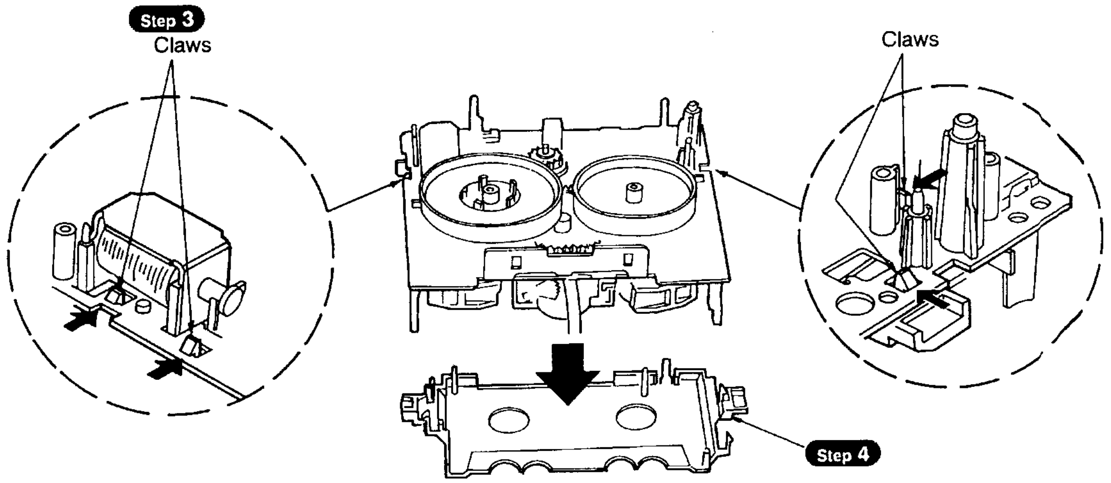

a
b
[XTW26+12S]
[XTW26+6L]

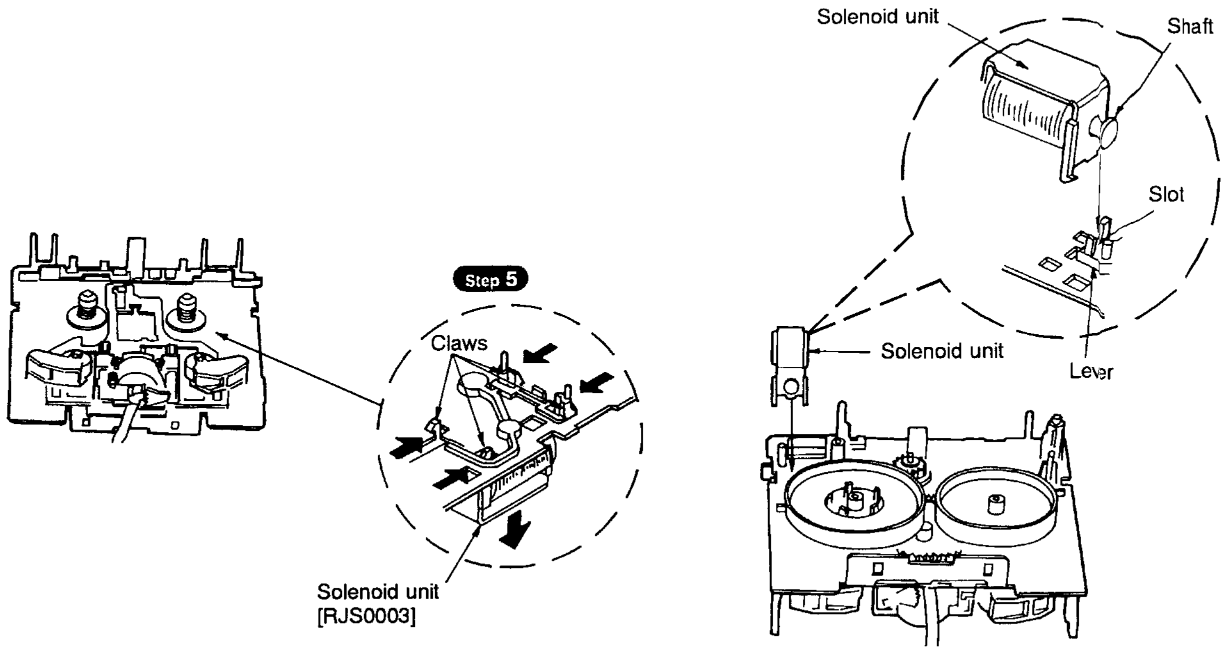
## 3. Replacement of the parts mounted on mechanism P.C.B. and solenoid unit

- Follow the Step 1 ~ Step 3 of item 2 in main component replacement procedures on page 7.


Step 1
a
Mechanism P.C.B.
Step 2

Step 2 Unsolder the terminals.


Step 3
Claws
Claws
Step 4


Solenoid unit
Shaft
Slot
Step 5
Claws
Solenoid unit
Lever
Solenoid unit
[RJS0003]

**NOTE**

**Notice for installing the solenoid unit**

- The shaft of solenoid unit should be aligned with the slot of lever.

## ■ Measurements an Adjustments

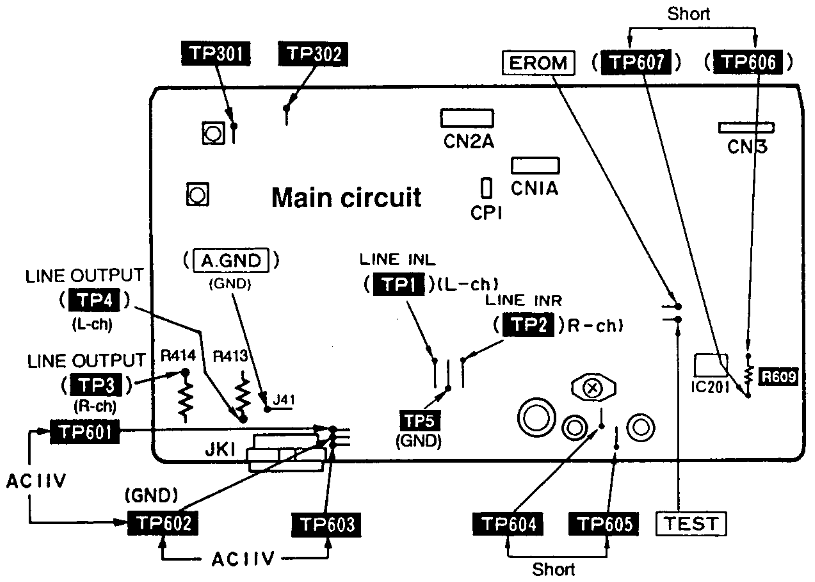
**This unit RS-CH510 is designed to operate on power supplied from the Amplifier (SE-CH510) through Tuner/Sound Processor (ST-CH510).**
**When connecting the unit to other system components, do not connect to the Amplifier (SE-CH510) directly. Be sure to connect this unit through the Tuner/Sound Processor (ST-CH510).**
**When operating the unit RS-CH510 alone for testing and servicing, without having power supplied from the Amplifier (SE-CH510) and the Tuner/Sound Processor (ST-CH510), use the following method.**

### • To Supply Power Source

1. Short test points between TP604 and TP605, and TP606 and TP607 at the resistor **R609** as shown in Fig. 1.
2. Apply 11 V AC power to test points between TP601 and TP602 (GND), and TP603 and TP602 (GND).
   (10 V AC power can be also applied when using adjustment tool for power supply.)

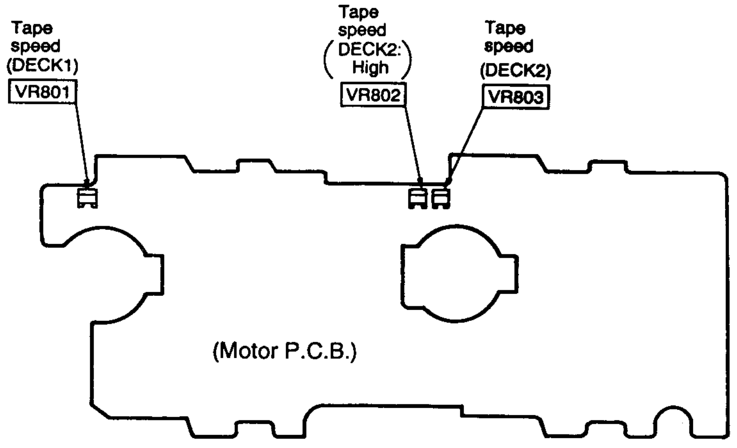
### • To Check Signals

Connect an oscilloscope or a built-in amplifier speaker between line output for L-ch (TP3) and jumper (TP5), and line out for R-ch (TP4) and jumper (TP5) and check if the signals are outputting from this unit.



Short
TP301
TP302
EROM
(TP607)
(TP606)
CN2A
CN3
Main circuit
CNIA
CPI
LINE OUTPUT
(TP4)
(L-ch)
(A.GND)
(GND)
LINE INL
(TP1)(L-ch)
LINE INR
(TP2)R-ch)
LINE OUTPUT
(TP3)
(R-ch)
R414
R413
J41
IC201
R609
TP601
TP5
(GND)
JKI
AC IIV
(GND)
TP602
TP603
AC IIV
TP604
TP605
TEST
Short

Fig. 1



Tape speed (DECK1)
VR801
Tape speed (DECK2: High)
VR802
Tape speed (DECK2)
VR803
(Motor P.C.B.)

Fig. 2

### Measurement Condition

- Reverse-more selector switch; ⇄
- Dolby NR switch; OFF
- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature 20±5°C (68±9°F)

### Measuring instrument

- EVM (Electronic Voltmeter)
- AF oscillator
- Digital frequency counter

### Test tape

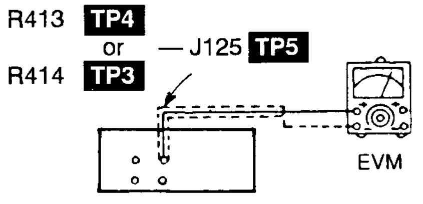
- Head azimuth adjustment (8 kH, -20 dB); QZZCFM
- Tape speed adjustment (3 kHz, -10 dB); QZZCWAT
- Playback gain adjustment (315 Hz, 0 dB); QZZCFM
- Recording frequency response adjustment; QZZCRA (Normal blank Tape)

### HEAD AZIMUTH ADJUSTMENT (DECK 1/2)

1. Connect the measuring instrument as shown in Fig. 3.
2. Replace azimuth screws for both forward and reverse direction after removing the screw-locking bond left on the head base.
   Fine adjustment of azimuth can not be performed with remaining the bond on the head base.
   (Supply part No. of azimuth adjusting screw: **RHD17015**)
3. Playback the azimuth adjustment portion (8 kHz, -20 dB) of test tape (QZZCFM). Adjust the azimuth adjusting screw until the outputs of the L/R-ch are maximized. (Refer to Fig. 4.)
4. Perform the same adjustment in reverse playback mode.

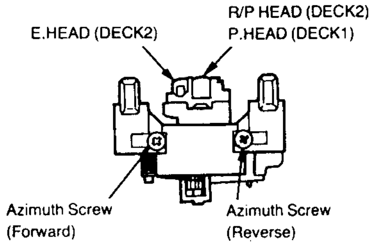
### Check of the level difference forward and reverse directions

5. Playback the playback gain adjustment portion (315 Hz, 0 dB) of test tape (QZZCFM). Check if level difference between forward and reverse direction is within 1 dB.
6. After the adjustment, apply screwlock to the azimuth adjusting screw.



R413 TP4
or
R414 TP3
— J125 TP5
EVM

Fig. 3



R/P HEAD (DECK2)
P.HEAD (DECK1)
E.HEAD (DECK2)
Azimuth Screw (Forward)
Azimuth Screw (Reverse)

Fig. 4

### TAPE SPEED ADJUSTMENT (DECK 1/2)

**Normal speed (Standard value: 3000±45 Hz)**

1. Playback the middle portion of the test tape (QZZCWAT).
2. Adjust Deck 1 = **VR801** and Deck 2 = **VR803** for the output value shown below. (Refer to Fig. 2.)

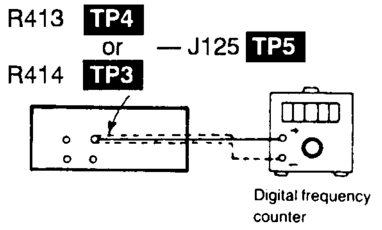
**Adjustment target: 3000±15 Hz (NORMAL speed)**
**Standard value: 3000±45 Hz (NORMAL speed)**

**High speed [Set the unit to forward (FWD) mode.]**

3. Short-circuit the TEST jumper ("DECK 1" or "DECK 2" indicator blinks).
4. Playback the middle portion on the test tape (QZZCWAT).
5. Press the one touch tape edit (High) button.
   This will set the high speed mode.
6. At that time, check if the output from DECK 1 is within the standard value.

**Standard value: 6000±600 Hz (HIGH speed)**

7. Adjust **VR802** so that the output frequency of DECK 2 is within **±30 Hz** for the value of the output frequency of DECK 1. (Refer to Fig. 2.)



R413 TP4
or
R414 TP3
— J125 TP5
Digital frequency counter

Fig. 5

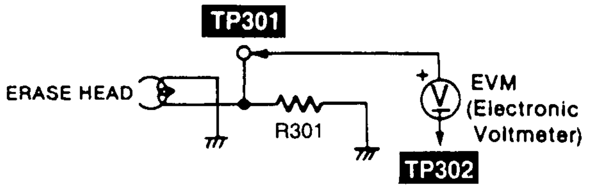
### ERASE CURRENT CONFIRMATION (DECK2)

1. Short-circuit the TEST jumper.
2. Press the REC PAUSE button.
3. Check if the output at this time between the erase current confirmation point **TP301** and **TP302** (chassis) (the output on both edged of R301) is within the standard value. (Refer to Fig. 6.)

**Standard value: 160±25 mA**

4. Disconnect the TEST jumper from the frame ground.

**NOTE:**
The test tape is not required when confirming the erase current.



TP301
ERASE HEAD
R301
EVM (Electronic Voltmeter)
TP302

Fig. 6

**The RS-CH510 can automatically adjust playback gain and rec./play frequency response & gain.**

**Automatic adjustment of playback gain and rec./play frequency response & gain**

A microprocessor (IC701) used within the RS-CH510 automatically adjusts its playback gain and rec./play frequency response & gain (factory adjustment) and stores adjustment data to an EEPROM chip (IC702). (potentiometers have conventionally been used for these adjustments.)

Playback gain adjustment
Rec./play frequency response & gain adjustment
— Microprocessor (IC701) (Auto adjustment) — EEPROM (IC702) (Data memory)
— Conventionally adjusted with potentiometers.

If the EEPROM chip (IC702) or any of the head AF signal line components is replaced for servicing, the unit requires readjustment. (Refer to page 11, 12.)

## ●Preparation for making automatic adjustments

1. Find the beginning of the 315 Hz, 0 dB test signal recorded on the test tape (QZZCFM).
2. Switch off the power to the unit and then make the following connections.
   a) Connect an AF oscillator between **TP1** (LINE IN, left channel) and **TP5**, and between **TP2** (LINE IN, right channel) and **TP5**. (Refer to Fig. 1 and Fig. 7.)
   b) Connect an EVM (AC range) between **TP3** (LINE OUT, left channel) and **TP5**, and between **TP4** (LINE OUT, right channel) and **TP5**. (Refer to Fig. 1 and Fig. 7.)
   c) Connect EROM and TEST to the A. GND. (Refer to Fig. 1 and Fig. 8.)
      - When EROM is connected to the A. GND and the power is switched on, the memory of the EEPROM (IC702) will be erased.
      - When TEST is connected to the A. GND and the power is switched on, the unit will be in the adjustment mode.
3. Switch on the power to the unit. (Refer to page 9 for information on how to connect the power supply.)
   - The Deck 1/2 indicators and the CCRT indicator will begin flashing. (Refer to Fig. 9.)
4. Use the AF oscillator to apply a 315 Hz, -20 dB (100 mV) signal to the unit.
5. Without a tape inserted in either Deck 1 or Deck 2, hold the REC PAUSE button down and confirm that the signal is being output from **TP3** and **TP4**.
   - The signal is output from **TP3** and **TP4** only while the REC PAUSE button is held down. When the button is released, the output will stop.
6. Adjust the output of the AF oscillator so that the output from **TP3** and **TP4** becomes 400 mV, and then hold the REC PAUSE button down again for at least 5 seconds.
   - The reference signal will be stored in the memory of the EEPROM (IC702).
7. Release the REC PAUSE button.
8. Disconnect EROM from the A. GND.
   - Leave TEST connected to the A. GND.
   (The Deck 1/2 indicators are flashing at this time.)

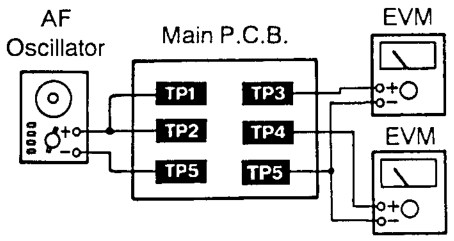


Fig. 7

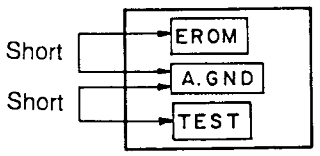


Fig. 8

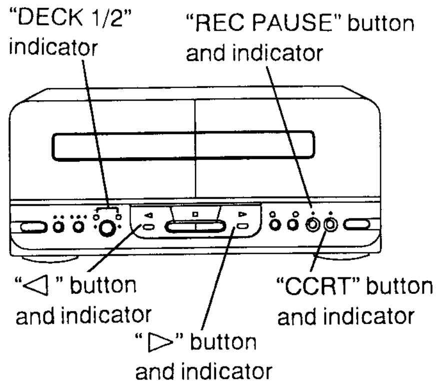
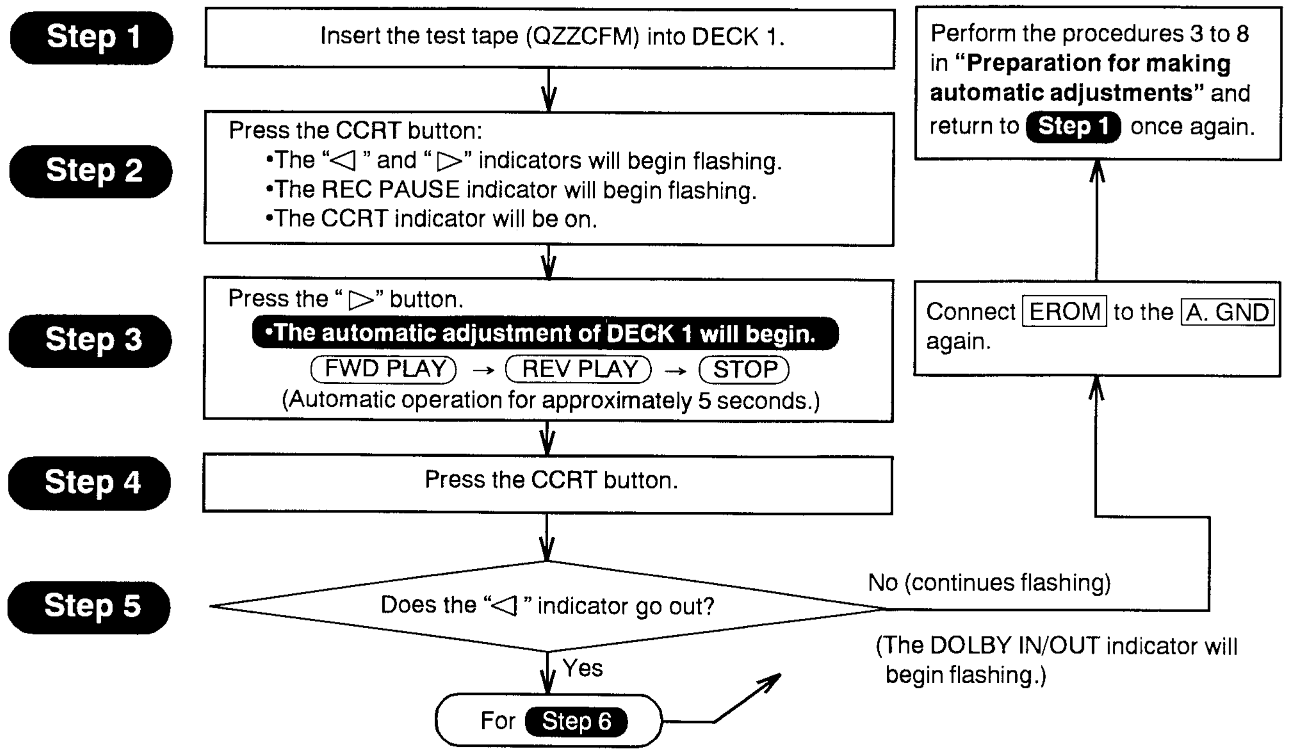


Fig. 9

## ●PLAYBACK GAIN ADJUSTMENT



**Step 1** Insert the test tape (QZZCFM) into DECK 1.

**Step 2** Press the CCRT button:
- The "◁" and "▷" indicators will begin flashing.
- The REC PAUSE indicator will begin flashing.
- The CCRT indicator will be on.

**Step 3** Press the "▷" button.
**•The automatic adjustment of DECK 1 will begin.**
(FWD PLAY) → (REV PLAY) → (STOP)
(Automatic operation for approximately 5 seconds.)

**Step 4** Press the CCRT button.

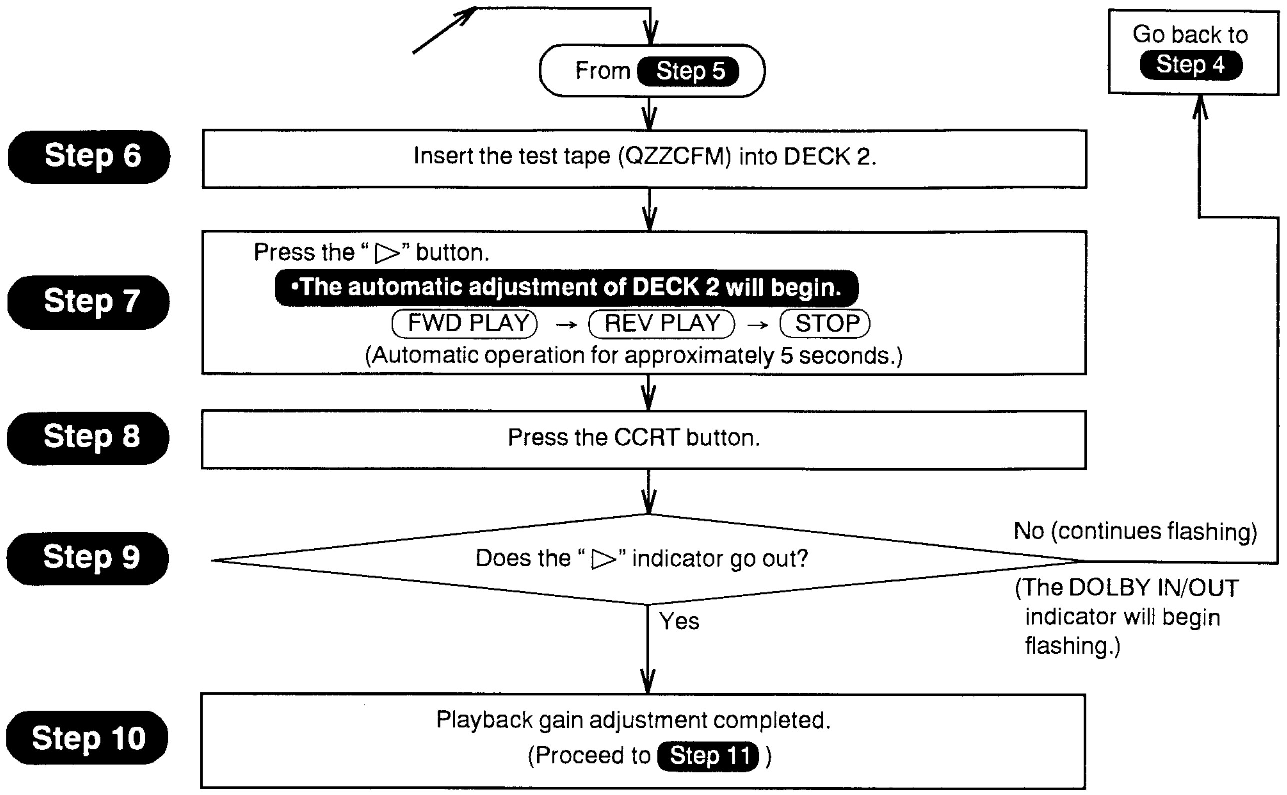
**Step 5** Does the "◁" indicator go out?

Yes: For **Step 6**

No (continues flashing): (The DOLBY IN/OUT indicator will begin flashing.)

Connect EROM to the A. GND again.

Perform the procedures 3 to 8 in **"Preparation for making automatic adjustments"** and return to **Step 1** once again.



From **Step 5**

**Step 6** Insert the test tape (QZZCFM) into DECK 2.

**Step 7** Press the "▷" button.
**•The automatic adjustment of DECK 2 will begin.**
(FWD PLAY) → (REV PLAY) → (STOP)
(Automatic operation for approximately 5 seconds.)

**Step 8** Press the CCRT button.

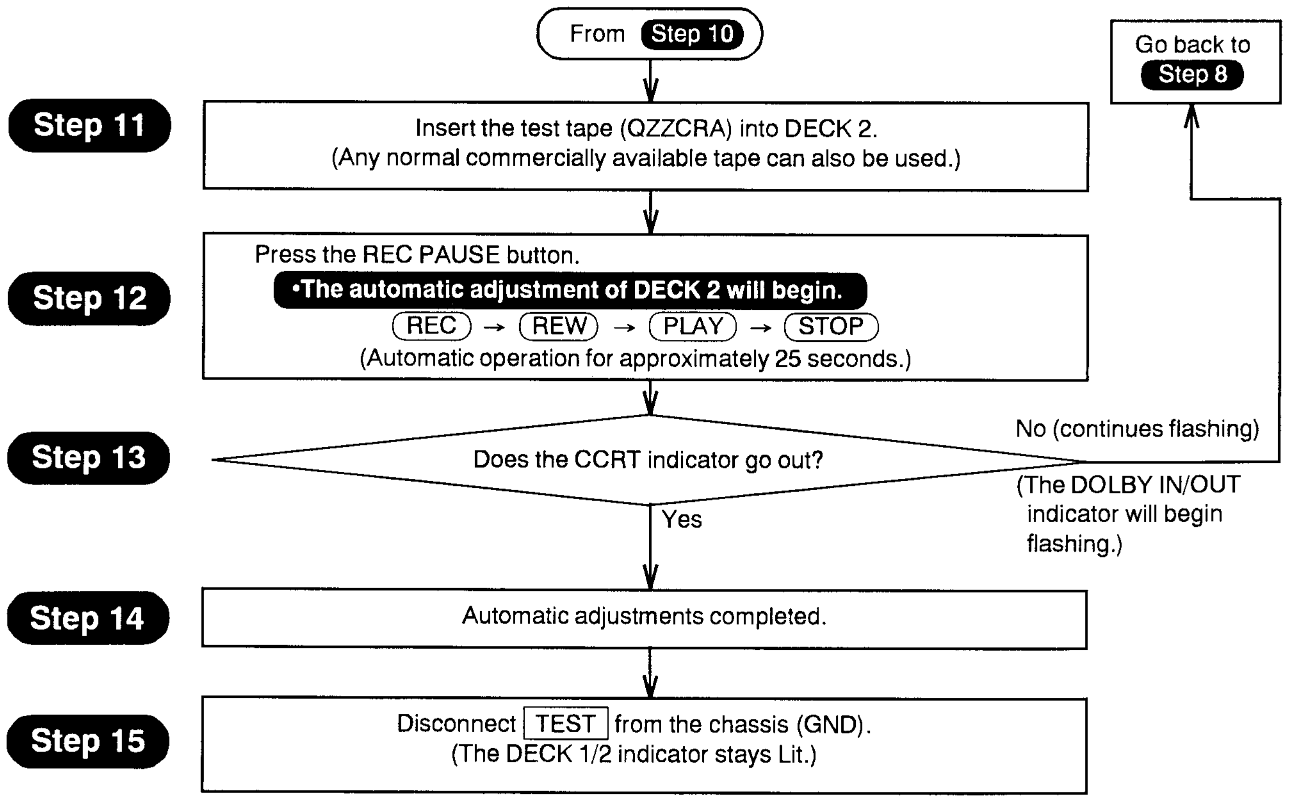
**Step 9** Does the "▷" indicator go out?

No (continues flashing): (The DOLBY IN/OUT indicator will begin flashing.) Go back to **Step 4**

Yes

**Step 10** Playback gain adjustment completed.
(Proceed to **Step 11**)

## ●OVERALL GAIN ADJUSTMENT AND OVERALL FREQUENCY ADJUSTMENT



From **Step 10**

**Step 11** Insert the test tape (QZZCRA) into DECK 2.
(Any normal commercially available tape can also be used.)

**Step 12** Press the REC PAUSE button.
**•The automatic adjustment of DECK 2 will begin.**
(REC) → (REW) → (PLAY) → (STOP)
(Automatic operation for approximately 25 seconds.)

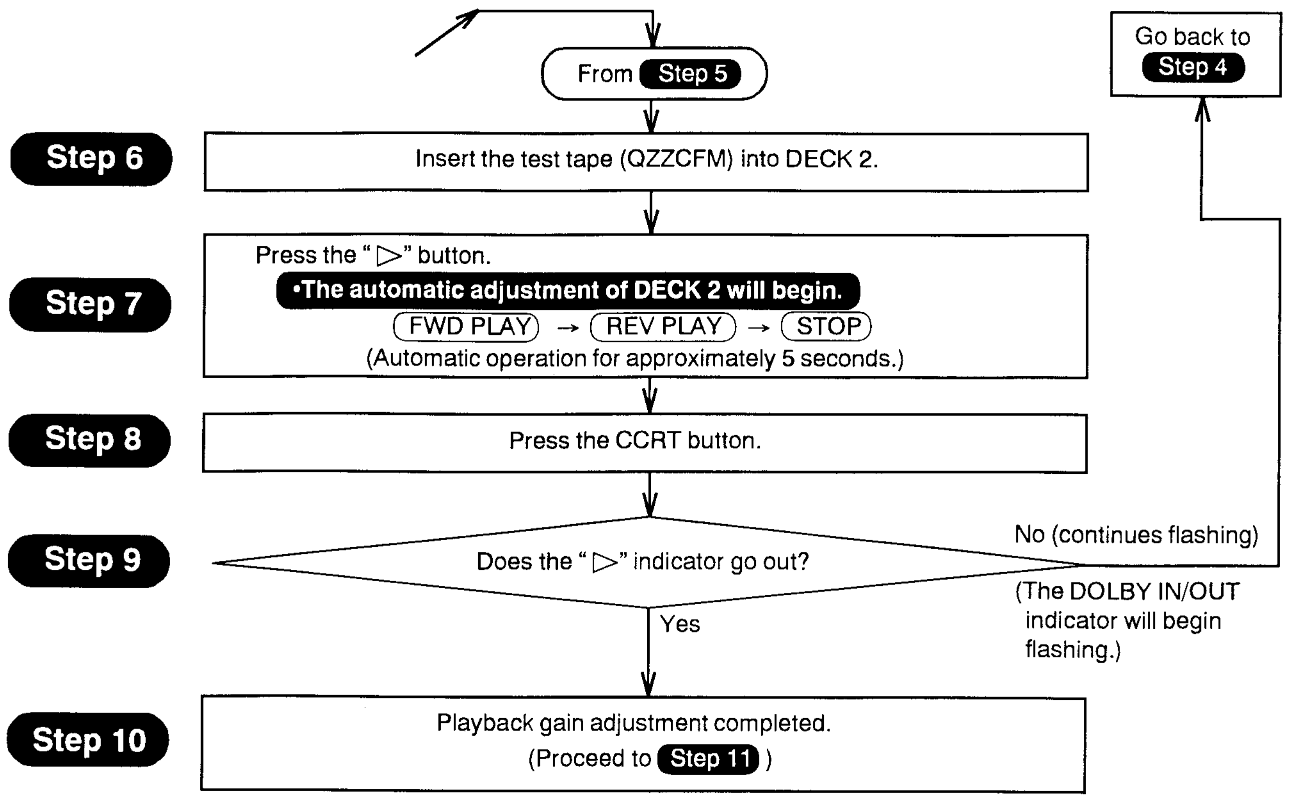
**Step 13** Does the CCRT indicator go out?

No (continues flashing): (The DOLBY IN/OUT indicator will begin flashing.) Go back to **Step 8**

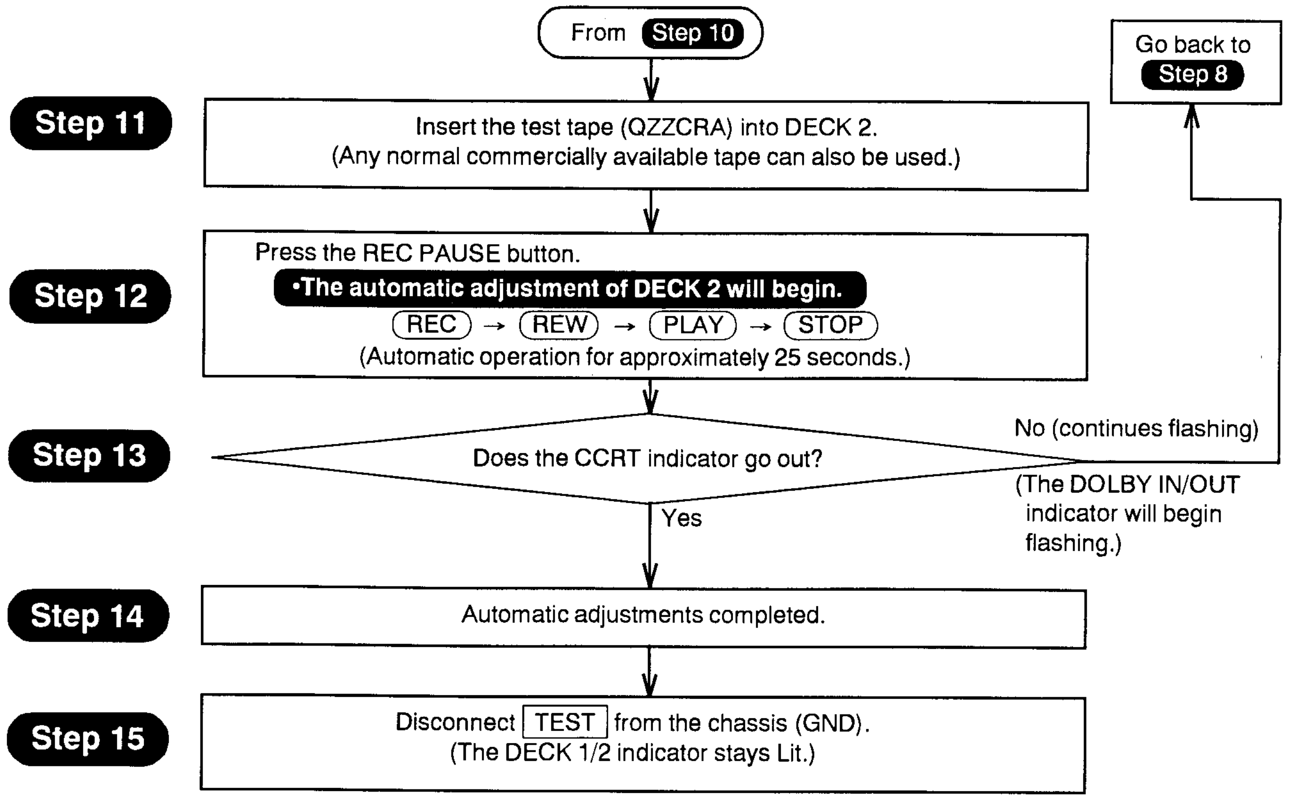
Yes

**Step 14** Automatic adjustments completed.

**Step 15** Disconnect TEST from the chassis (GND).
(The DECK 1/2 indicator stays Lit.)


From Step 5
Go back to Step 4
Step 6
Insert the test tape (QZZCFM) into DECK 2.
Step 7
Press the "▷" button.
•The automatic adjustment of DECK 2 will begin.
(FWD PLAY) → (REV PLAY) → (STOP)
(Automatic operation for approximately 5 seconds.)
Step 8
Press the CCRT button.
Step 9
Does the "▷" indicator go out?
No (continues flashing)
(The DOLBY IN/OUT indicator will begin flashing.)
Yes
Step 10
Playback gain adjustment completed.
(Proceed to Step 11)

## ●OVERALL GAIN ADJUSTMENT AND OVERALL FREQUENCY ADJUSTMENT


From Step 10
Go back to Step 8
Step 11
Insert the test tape (QZZCRA) into DECK 2.
(Any normal commercially available tape can also be used.)
Step 12
Press the REC PAUSE button.
•The automatic adjustment of DECK 2 will begin.
(REC) → (REW) → (PLAY) → (STOP)
(Automatic operation for approximately 25 seconds.)
Step 13
Does the CCRT indicator go out?
No (continues flashing)
(The DOLBY IN/OUT indicator will begin flashing.)
Yes
Step 14
Automatic adjustments completed.
Step 15
Disconnect TEST from the chassis (GND).
(The DECK 1/2 indicator stays Lit.)

## ●Perform the following recording/playback frequency response and gain adjustment checks

**1. Playback gain check**

1-1. Find the start of the 315 Hz/0 dB section of the test tape (QZZCFM), insert the tape into Deck1 and 2, and play it back (FWD).

1-2. Confirm that the output between TP3 / TP4 and TP5 agrees with the following rated value:
**400 mV ± 0.5 dB**

**2. Playback frequency response check (Decks 1 and 2)**

Playback the 315 Hz/-20 dB and 12.5 kHz to 63 Hz/-20 dB sections of the test tape (QZZCFM) and then, using the 315 Hz/-20 dB playback output as a reference (0 dB), confirm that the playback frequency response is within the range shown in Fig. 10.

Output points: between TP3 / TP4 and TP5.

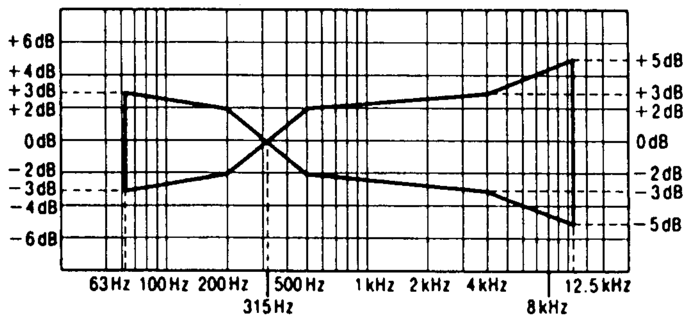


Fig. 10

**3. Recording/playback frequency response and gain check**

3-1. Insert a Normal-type blank tape (QZZCRA) into Deck 2.

3-2. Input a 1 kHz signal between TP1 / TP2 and TP5, and use the attenuator to set the output between TP3 / TP4 and TP5 to 400 mV.

3-3. Record the 1 kHz signal.

3-4. Playback the recorded signal and confirm that the output between TP3 / TP4 and TP5 agrees with the following rated value:
**400 mV ± 1 dB**

3-5. Without adjusting the output setting from step 3-2, use the attenuator to further attenuate the input signal by 20 dB and record signals of 50 Hz, 100 Hz, 300 Hz, 500 Hz, 3 kHz, 10 kHz and 12.5 kHz.

3-6. Playback the recorded signals and, using the 1kHz playback output as a reference (0 dB), confirm that the output between TP3 / TP4 and TP5 confirms to the overall frequency response shown in Fig. 11.

3-7. Insert first a blank Chrome-type tape (QZZCRX) and then a blank Metal-type tape (QZZCRZ) into Deck 2.

3-8. Repeat steps 3-5 and 3-6 for each tape and confirm that the output for each conforms to the overall frequency response shown in Fig. 12.

**Normal Overall frequency response chart (NR OUT)**

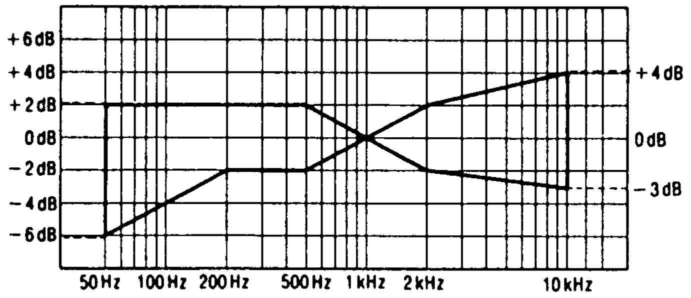


Fig. 11

**CrO₂ Metal Overall frequency response chart (NR OUT)**

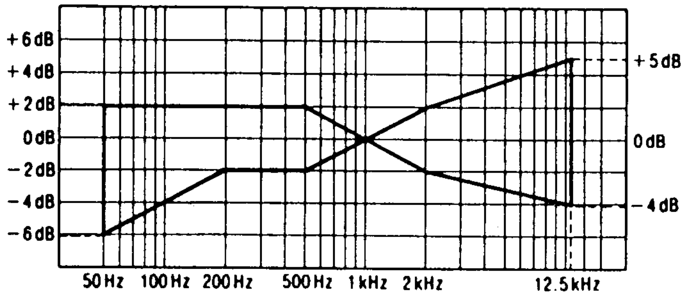
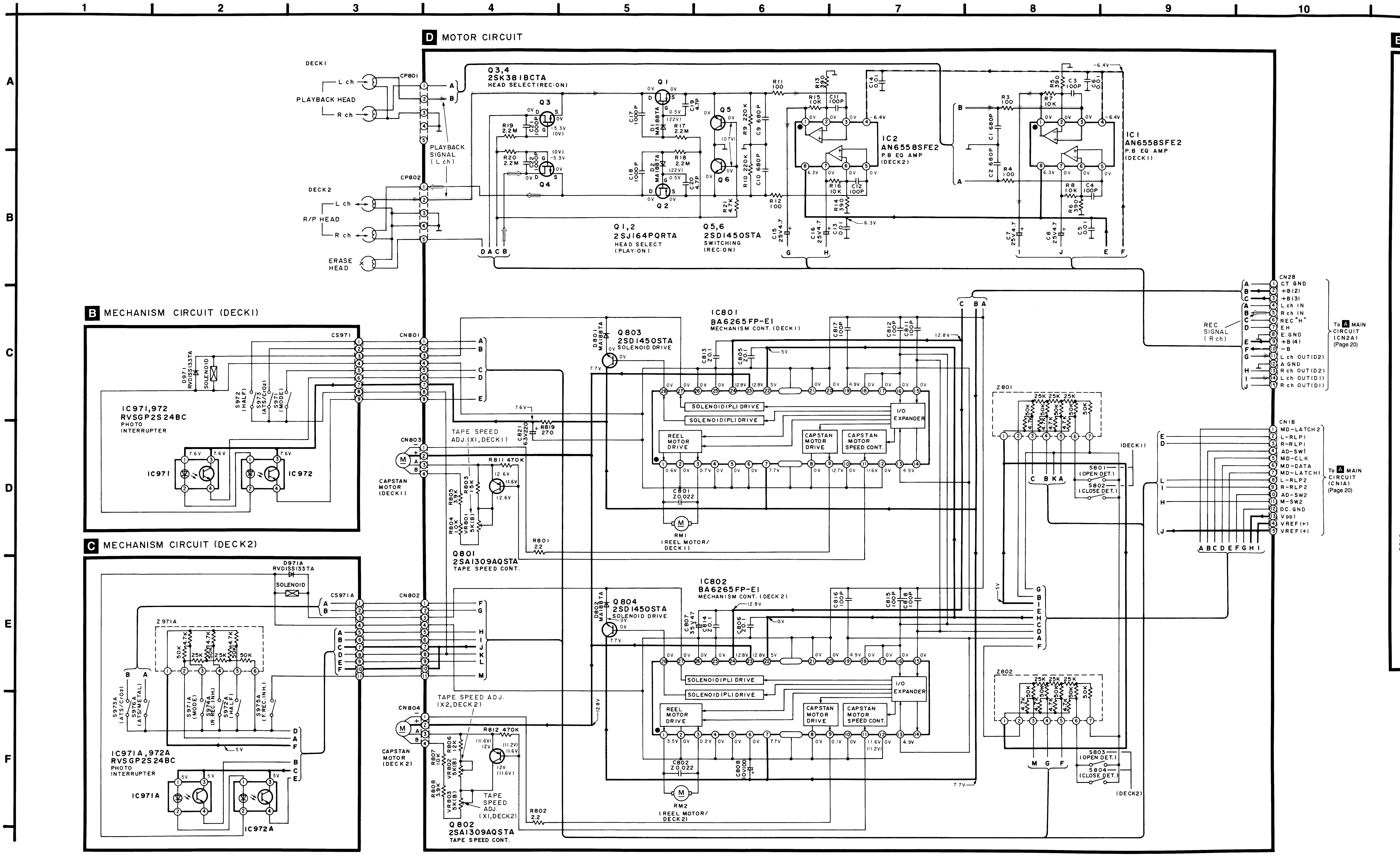


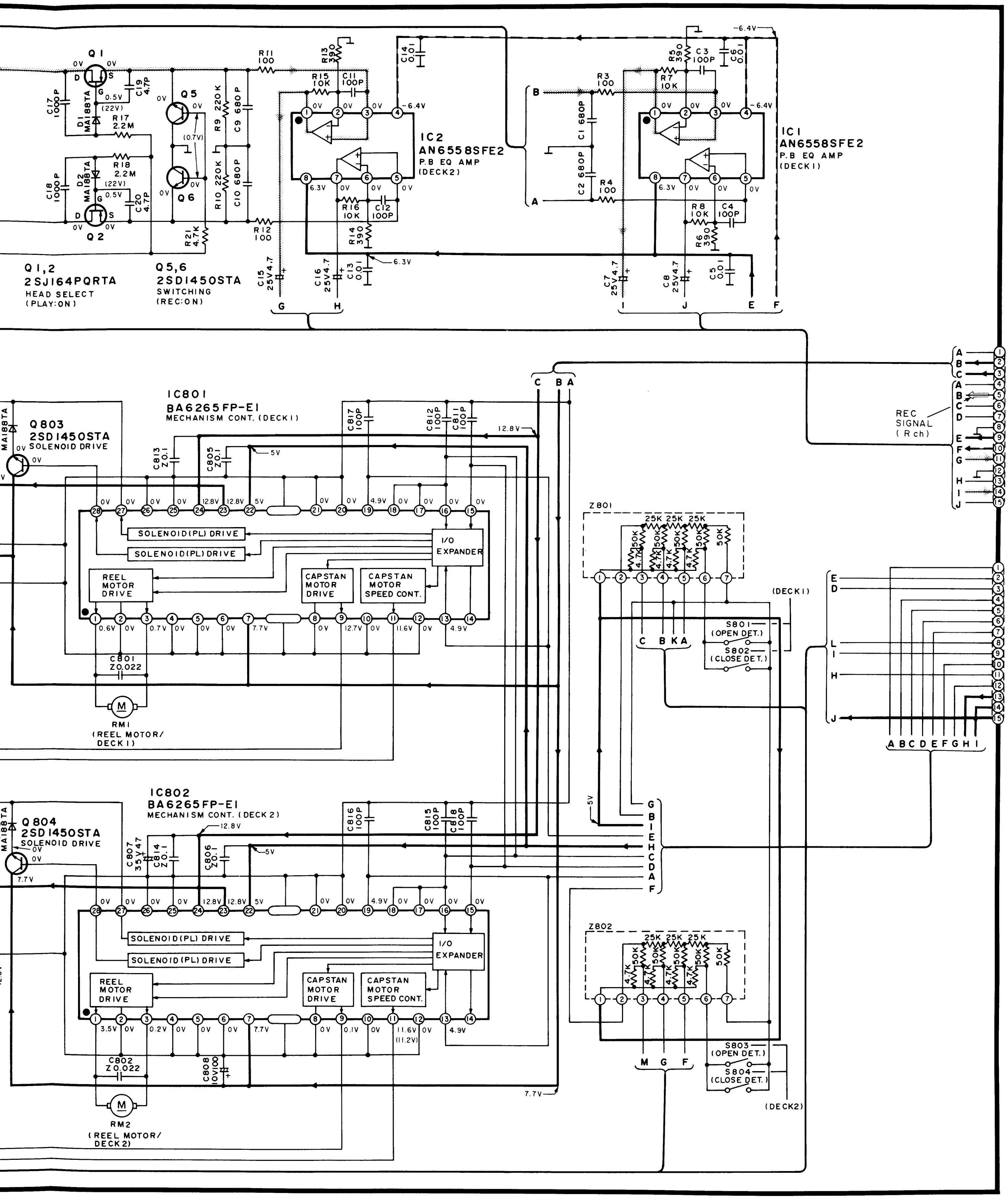
Fig. 12

## ■ Schematic Diagram ● Mechanism (DECK 1), (DECK 2)/Mortor Control/Operation circuit (Parts list on Page 33~36)

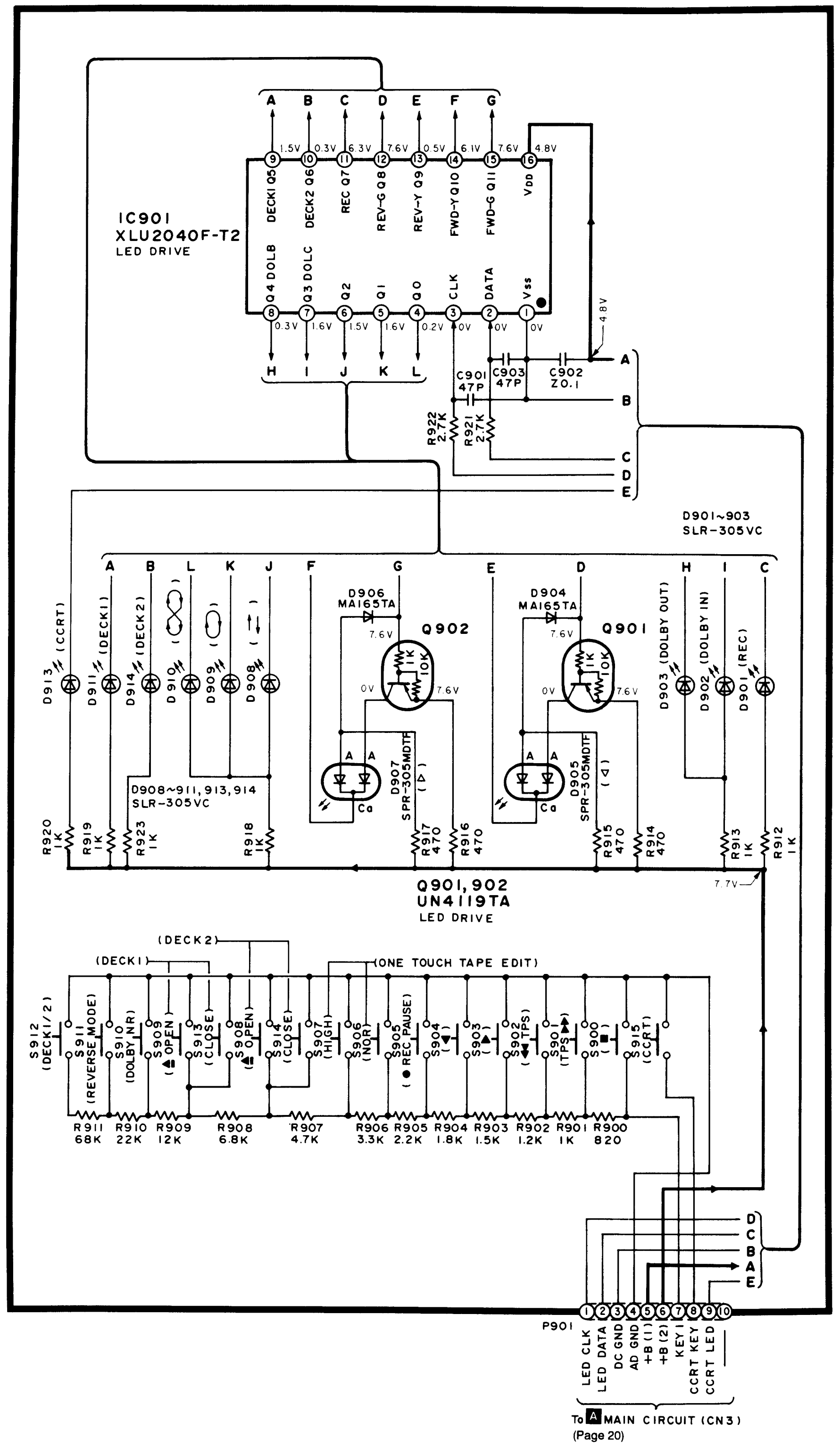

D MOTOR CIRCUIT
DECK1
PLAYBACK HEAD
L ch
R ch
CP801
CP802
PLAYBACK SIGNAL (L ch)
DECK2
R/P HEAD
ERASE HEAD
Q3,4 2SK381BCTA HEAD SELECT(REC:ON)
Q1,2 2SJ164PQRTA HEAD SELECT (PLAY:ON)
Q5,6 2SD1450STA SWITCHING (REC:ON)
IC2 AN6558SFE2 P.B EQ AMP (DECK2)
IC1 AN6558SFE2 P.B EQ AMP (DECK1)
B MECHANISM CIRCUIT (DECK1)
CS971
CN801
D971 RVDISS133TA
SOLENOID
S972 (HALF)
S973 (ATS/CrO2)
S971 (MODE)
IC971,972 RVSGP2S24BC PHOTO INTERRUPTER
IC971
IC972
C MECHANISM CIRCUIT (DECK2)
D971A RVDISS133TA
SOLENOID
CS971A
CN802
Z971A
S973A (ATS/CrO2)
S976A (ATS/METAL)
S971A (MODE)
S974A (R.REC.INH.)
S972A (HALF)
S975A (F.REC.INH.)
IC971A,972A RVSGP2S24BC PHOTO INTERRUPTER
IC971A
IC972A
Q803 2SD1450STA SOLENOID DRIVE
D801 MA188TA
IC801 BA6265FP-EI MECHANISM CONT. (DECK1)
SOLENOID(PL) DRIVE
I/O EXPANDER
REEL MOTOR DRIVE
CAPSTAN MOTOR DRIVE
CAPSTAN MOTOR SPEED CONT.
C801 Z0.022
RM1 (REEL MOTOR/DECK1)
CN803
CAPSTAN MOTOR (DECK1)
TAPE SPEED ADJ.(X1,DECK1)
Q801 2SA1309AQSTA TAPE SPEED CONT.
R801 2.2
R819 270
C821 63V220
Q804 2SD1450STA SOLENOID DRIVE
D802 MA188TA
IC802 BA6265FP-EI MECHANISM CONT. (DECK 2)
C802 Z0.022
RM2 (REEL MOTOR/DECK2)
CN804
CAPSTAN MOTOR (DECK2)
TAPE SPEED ADJ. (X2,DECK2)
TAPE SPEED ADJ. (X1,DECK2)
Q802 2SA1309AQSTA TAPE SPEED CONT.
R802 2.2
Z801
Z802
(DECK1)
S801 (OPEN DET.)
S802 (CLOSE DET.)
(DECK2)
S803 (OPEN DET.)
S804 (CLOSE DET.)
REC SIGNAL (R ch)
CN2B
CT GND
+B(2)
+B(3)
L ch IN
R ch IN
REC "H"
EH
E.GND
+B(4)
-B
L ch OUT(D2)
A.GND
R ch OUT(D2)
L ch OUT(D1)
R ch OUT(D1)
To A MAIN CIRCUIT (CN2A) (Page 20)
CN1B
MD-LATCH2
L-RLP1
R-RLP1
AD-SW1
MD-CLK
MD-DATA
MD-LATCH1
L-RLP2
R-RLP2
AD-SW2
M-SW2
DC.GND
Vdd
VREF(+)
VREF(+)
To A MAIN CIRCUIT (CN1A) (Page 20)

## ation circuit (Parts list on Page 33~36)

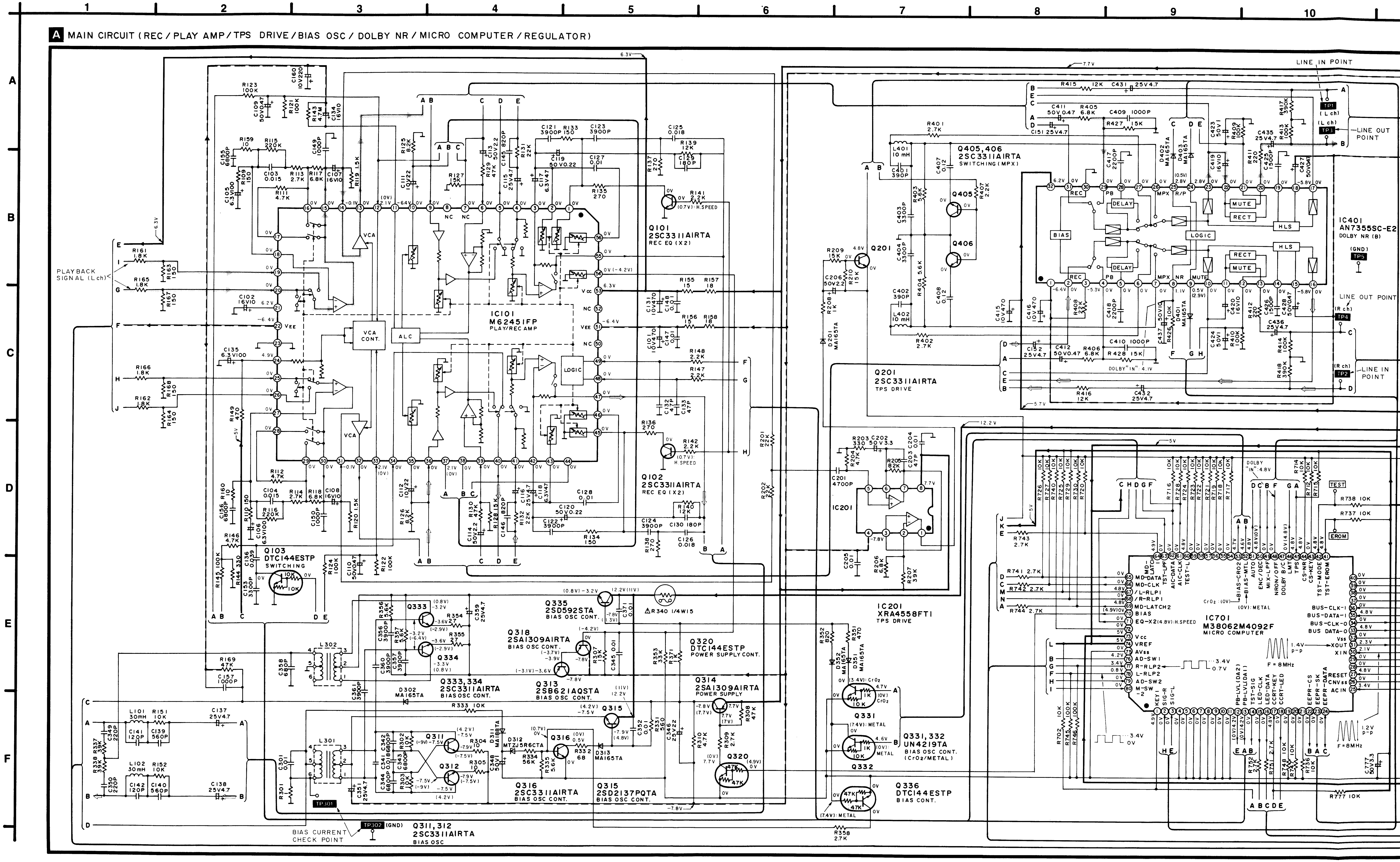
5 6 7 8 9 10 11 12 13 14


Q1,2
2SJ164PQRTA
HEAD SELECT
(PLAY:ON)
Q5,6
2SD1450STA
SWITCHING
(REC:ON)
IC2
AN6558SFE2
P.B EQ AMP
(DECK2)
IC1
AN6558SFE2
P.B EQ AMP
(DECK1)
IC801
BA6265FP-E1
MECHANISM CONT. (DECK1)
Q803
2SD1450STA
SOLENOID DRIVE
SOLENOID(PL) DRIVE
I/O EXPANDER
REEL MOTOR DRIVE
CAPSTAN MOTOR DRIVE
CAPSTAN MOTOR SPEED CONT.
RM1
(REEL MOTOR/ DECK1)
IC802
BA6265FP-E1
MECHANISM CONT. (DECK 2)
Q804
2SD1450STA
SOLENOID DRIVE
RM2
(REEL MOTOR/ DECK2)
Z801
Z802
S801 (OPEN DET.)
S802 (CLOSE DET.)
S803 (OPEN DET.)
S804 (CLOSE DET.)
(DECK1)
(DECK2)
REC SIGNAL (Rch)
CN2B
CT GND
+B(2)
+B(3)
L ch IN
R ch IN
REC "H"
EH
E.GND
+B(4)
-B
L ch OUT(D2)
A.GND
R ch OUT(D2)
L ch OUT(D1)
R ch OUT(D1)
To A MAIN CIRCUIT (CN2A) (Page 20)
CN1B
MD-LATCH2
L-RLP1
R-RLP1
AD-SW1
MD-CLK
MD-DATA
MD-LATCH1
L-RLP2
R-RLP2
AD-SW2
M-SW2
DC.GND
Vod1
VREF(+)
VREF(+)
To A MAIN CIRCUIT (CN1A) (Page 20)

**E** OPERATION CIRCUIT

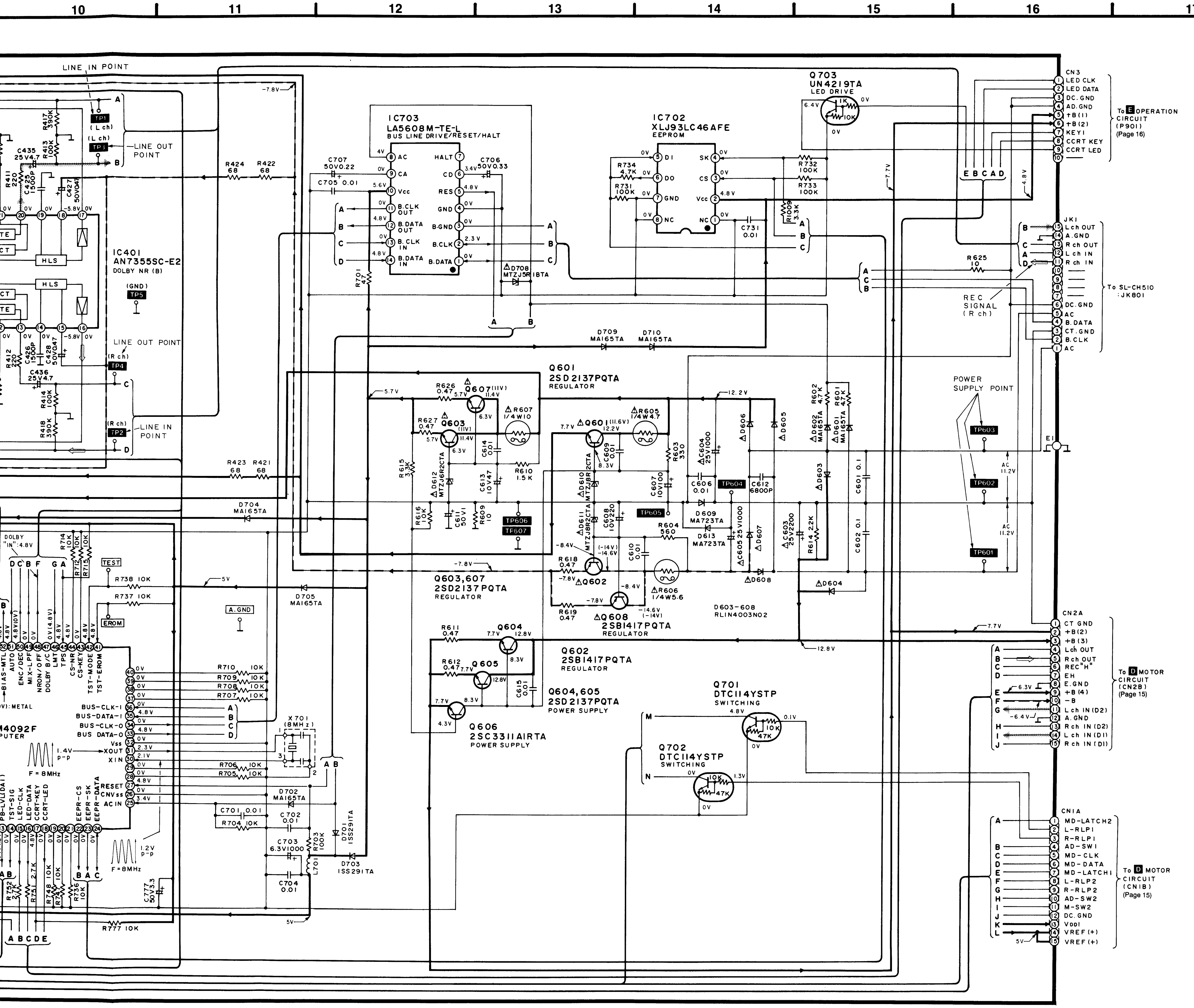

IC901
XLU2040F-T2
LED DRIVE
DECK1 O5
DECK2 O6
REC O7
REV-G O8
REV-Y O9
FWD-Y O10
FWD-G O11
VDD
O4 DOLB
O3 DOLC
O2
O1
O0
CLK
DATA
Vss
D901~903
SLR-305VC
D906 MA165TA
D904 MA165TA
Q902
Q901
D907 SPR-305MDTF
D905 SPR-305MDTF
D908~911,913,914
SLR-305VC
Q901,902
UN4119TA
LED DRIVE
(DECK2)
(DECK1)
(ONE TOUCH TAPE EDIT)
S912 (DECK1/2)
S911 (REVERSE MODE)
S910 (DOLBY NR)
S909 (OPEN)
S913 (CLOSE)
S908 (OPEN)
S914 (CLOSE)
S907 (HI)
S906 (NOR)
S905 (● REC PAUSE)
S904
S903
S902 (TPS)
S901 (TPS)
S900
S915 (CCRT)
R911 68K R910 22K R909 12K R908 6.8K R907 4.7K R906 3.3K R905 2.2K R904 1.8K R903 1.5K R902 1.2K R901 1K R900 820
P901
LED CLK
LED DATA
DC GND
AD GND
+B(1)
+B(2)
KEY1
CCRT KEY
CCRT LED
To A MAIN CIRCUIT (CN3) (Page 20)

## ● Main circuit (Parts list on Page 33～36)



**A** MAIN CIRCUIT (REC / PLAY AMP / TPS DRIVE / BIAS OSC / DOLBY NR / MICRO COMPUTER / REGULATOR)

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
IC101
M62451FP
PLAY/REC AMP
VCA
VCA CONT.
ALC
LOGIC
PLAYBACK SIGNAL (L ch)
Q101
2SC3311AIRTA
REC EQ (X2)
Q102
2SC3311AIRTA
REC EQ (X2)
Q103
DTC144ESTP
SWITCHING
Q201
2SC3311AIRTA
TPS DRIVE
IC201
XRA4558FT1
TPS DRIVE
Q405,406
2SC3311AIRTA
SWITCHING (MPX)
IC401
AN7355SC-E2
DOLBY NR (B)
LINE IN POINT
LINE OUT POINT
TP1
TP2
TP3
TP4
TP5
(GND)
BIAS
DELAY
MUTE
RECT
HLS
MPX
R/P
NR
REC
PB
DOLBY "IN": 4.1V
Q333,334
2SC3311AIRTA
BIAS OSC CONT.
Q335
2SD592STA
BIAS OSC CONT.
Q318
2SA1309AIRTA
BIAS OSC CONT.
Q313
2SB621AQSTA
BIAS OSC CONT.
Q320
DTC144ESTP
POWER SUPPLY CONT.
Q314
2SA1309AIRTA
POWER SUPPLY
Q316
2SC3311AIRTA
BIAS OSC CONT.
Q315
2SD2137PQTA
BIAS OSC CONT.
Q311,312
2SC3311AIRTA
BIAS OSC
Q331,332
UN4219TA
BIAS OSC CONT. (CrO2/METAL)
Q336
DTC144ESTP
BIAS CONT.
ΔR340 1/4W15
L301
L302
TP301
TP302 (GND)
BIAS CURRENT CHECK POINT
IC701
M38062M4092F
MICRO COMPUTER
TEST
EROM
F = 8MHz
1.4V P-P
1.2V P-P
3.4V
0.7V
BUS-CLK-I
BUS-DATA-I
BUS-CLK-O
BUS DATA-O
Vss
XOUT
XIN
RESET
CNVss
AC IN
MD-DATA
MD-CLK
/L-RLP1
/R-RLP1
MD-LATCH2
BIAS
EQ-X2(4.8V):H.SPEED
Vcc
VREF
AVss
AD-SW1
R-RLP2
L-RLP2
AD-SW2
M-SW-2
6.3V
7.7V
12.2V
5V
5.7V
-7.8V


10
11
12
13
14
15
16
17
18
19
LINE IN POINT
LINE OUT POINT
LINE OUT POINT
LINE IN POINT
TP1 (L ch)
TP3 (L ch)
TP4 (R ch)
TP2 (R ch)
IC401 AN7355SC-E2 DOLBY NR (B)
(GND) TP5
IC703 LA5608M-TE-L BUS LINE DRIVE/RESET/HALT
IC702 XLJ93LC46AFE EEPROM
Q703 UN4219TA LED DRIVE
Q601 2SD2137PQTA REGULATOR
Q603,607 2SD2137PQTA REGULATOR
Q602 2SB1417PQTA REGULATOR
Q608 2SB1417PQTA REGULATOR
Q604,605 2SD2137PQTA POWER SUPPLY
Q606 2SC3311AIRTA POWER SUPPLY
Q701 DTC114YSTP SWITCHING
Q702 DTC114YSTP SWITCHING
D603-608 RLIN4003NO2
X701 (8MHz)
F = 8MHz
REC SIGNAL (R ch)
POWER SUPPLY POINT
TP601
TP602
TP603
TP604
TP605
TP606
TP607
CN3
To E OPERATION CIRCUIT (P901) (Page 16)
JK1
To SL-CH510 :JK801
CN2A
To D MOTOR CIRCUIT (CN2B) (Page 15)
CN1A
To D MOTOR CIRCUIT (CN1B) (Page 15)

- This schematic diagram may be modified at any time with the development of new technology.

**Notes:**

- **S801** : DECK 1 cassette holder open detect switch
- **S802** : DECK 1 cassette holder close detect switch
- **S803** : DECK 2 cassette holder open detect switch
- **S804** : DECK 2 cassette holder close detect switch
- **S900** : Stop switch (■)
- **S901** : Fast forward/tape program sensor switch (TPS ▶▶)
- **S902** : Rewind/tape program sensor switch (◀◀ TPS)
- **S903** : Forward side playback switch (▶)
- **S904** : Reverse side playback switch (◀)
- **S905** : Record pause switch (● REC PAUSE)
- **S906** : One-touch tape edit switch (NORMAL)
- **S907** : One-touch tape edit switch (HIGH)
- **S908** : DECK 2 cassette holder open switch (⏏ OPEN)
- **S909** : DECK 1 cassette holder open switch (⏏ OPEN)
- **S910** : Dolby noise reduction switch (DOLBY NR)
- **S911** : Reverse mode select switch (REVERSE MODE)
- **S912** : DECK 1/DECK 2 select switch (DECK 1/2)
- **S913** : DECK 1 cassette holder close switch (CLOSE)
- **S914** : DECK 2 cassette holder close switch (CLOSE)
- **S915** : CCRT switch (CCRT)
- **S971** : DECK 1 mode detect switch
- **S972** : DECK 1 half detect switch
- **S973** : DECK 1 CrO2 tape detect switch
- **S971A** : DECK 2 mode detect switch
- **S972A** : DECK 2 half detect switch
- **S973A** : DECK 2 CrO2 tape detect switch
- **S974A** : DECK 2 reverse side record prevention tab detect switch
- **S975A** : DECK 2 forward side record prevention tab detect switch
- **S976A** : DECK 2 METAL tape detect switch
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
- Voltage values and waveforms are measured as indicated in the schematic diagram when test points between TP604 and TP605, and between TP606 and TP607 are shorted.

No mark : Playback ( ) : Recording

- Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
Cover the parts boxes made of plastics with aluminum foil.
Ground the soldering iron.
Put a conductive mat on the work table.
Do not touch the legs of IC or LSI with the fingers directly.

- **Voltage and signal line**

━━▶━━ : Positive voltage line
━ ━ ▶ ━ ━ :Negative voltage line
░░░░ : Playback signal Line
⇨ : Recording signal Line

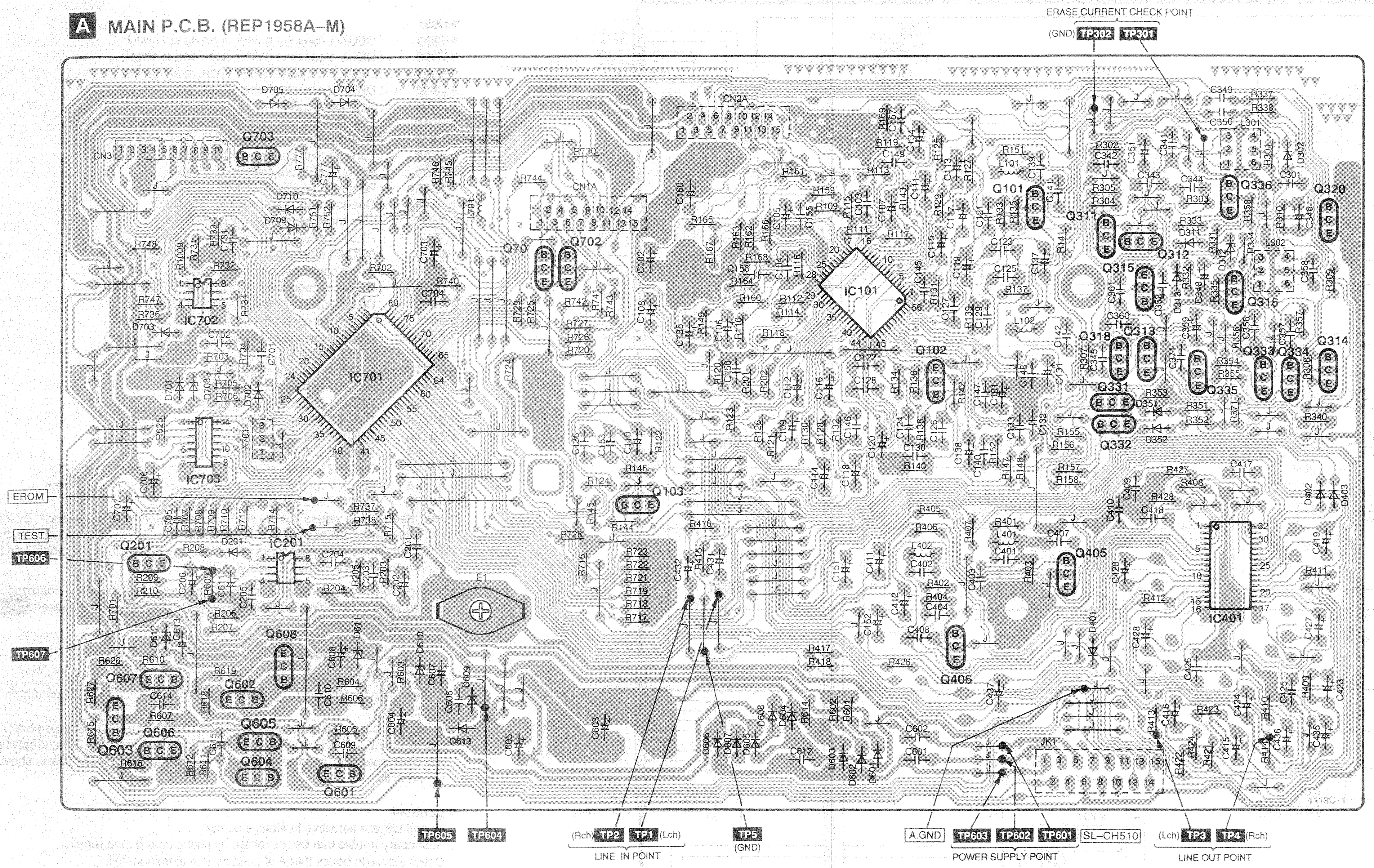
## Printed Circuit Board Diagram

1 2 3 4 5 6 7 8 9 10

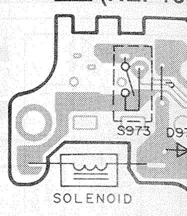
A B C D E F

- This circuit board diagram may be modified at any time with the development of new technology.

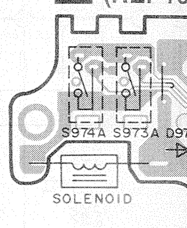
**A** MAIN P.C.B. (REP1958A–M)


ERASE CURRENT CHECK POINT
(GND) TP302 TP301
CN3
CN2A
CN1A
Q703
Q70 Q702
IC701
IC702
IC703
IC101
IC201
IC401
Q101
Q102
Q103
Q201
Q311 Q312 Q315 Q316 Q318 Q313 Q331 Q332 Q333 Q334 Q335 Q336 Q320 Q314
Q405 Q406
Q601 Q602 Q603 Q604 Q605 Q606 Q607 Q608
E1
JK1
EROM
TEST
TP606
TP607
TP605 TP604
(Rch) TP2 TP1 (Lch)
LINE IN POINT
TP5 (GND)
A.GND
TP603 TP602 TP601 SL-CH510
POWER SUPPLY POINT
(Lch) TP3 TP4 (Rch)
LINE OUT POINT
1118C-1

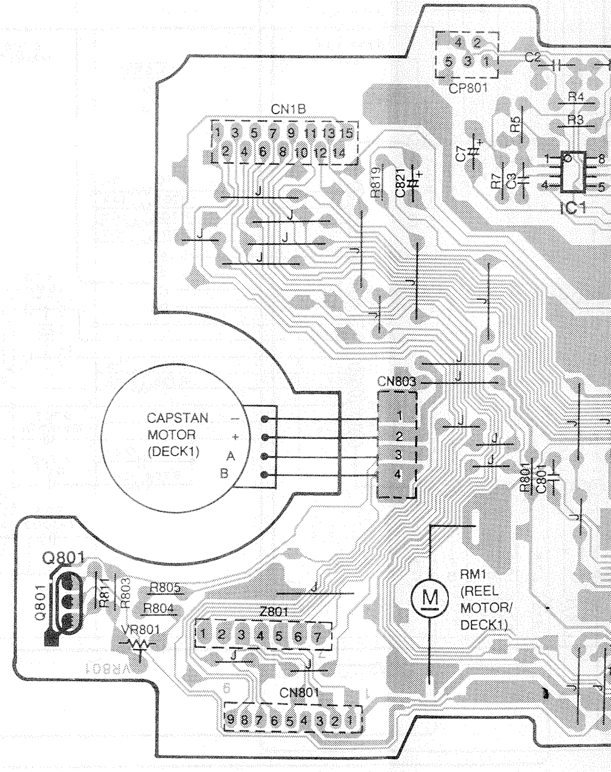
**B** MECHA
(REP16


S973
SOLENOID

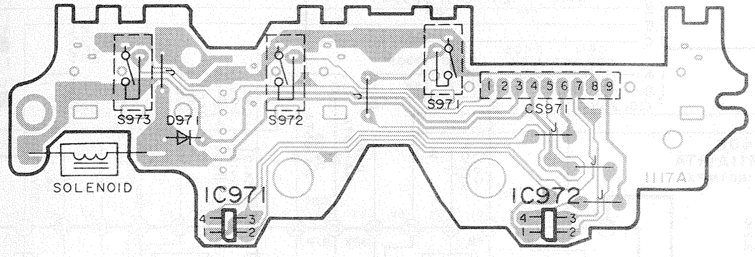
**C** MECHA
(REP16


S974A S973A
SOLENOID

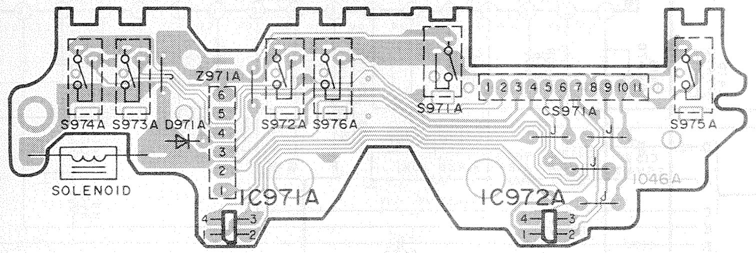
**D** MOTOR P.C.B. (REP1955A–T)


CP801
CN1B
IC1
CN803
CAPSTAN MOTOR (DECK1)
Q801
VR801
Z801
CN801
RM1 (REEL MOTOR/ DECK1)

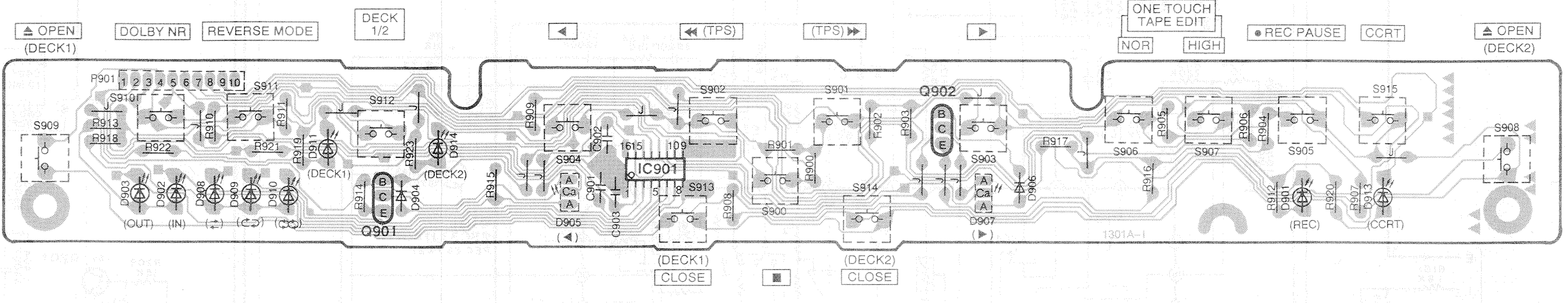
## B MECHANISM P.C.B. (DECK1)
(REP1655A)


S973
D971
S972
S971
CS971
1 2 3 4 5 6 7 8 9
SOLENOID
IC971
IC972
1117A

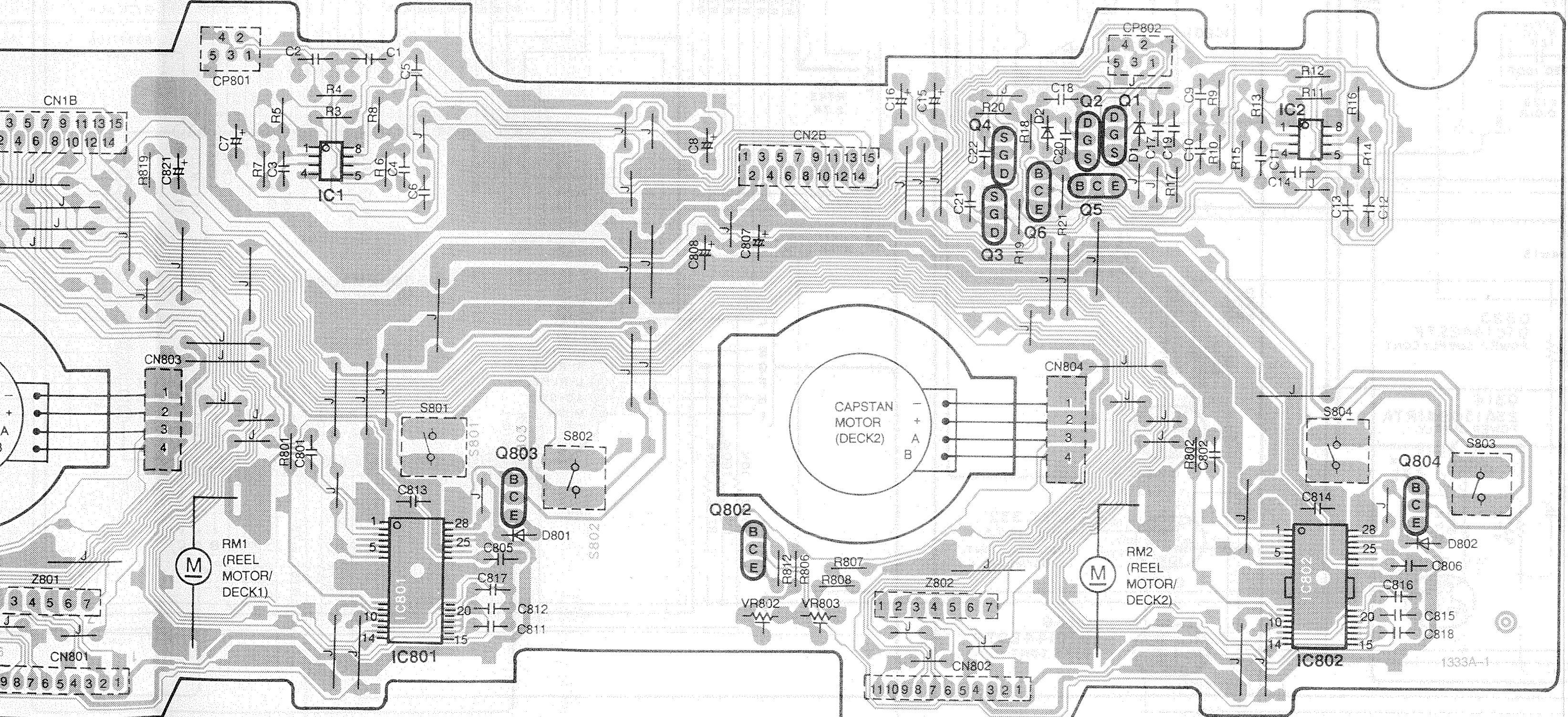
## C MECHANISM P.C.B. (DECK2)
(REP1656A)


Z971A
S974A
S973A
D971A
S972A
S976A
S971A
CS971A
S975A
1 2 3 4 5 6 7 8 9 10 11
SOLENOID
IC971A
IC972A
1046A

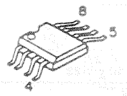
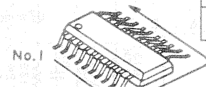
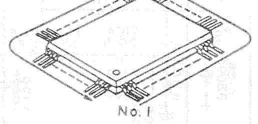
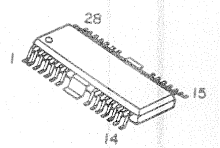
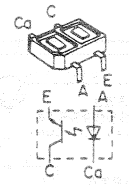
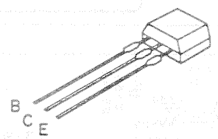
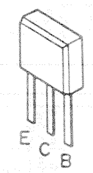
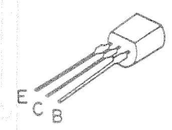
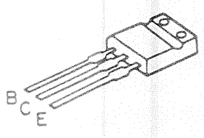
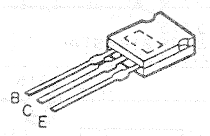
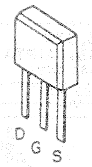
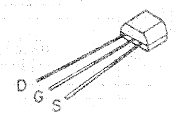
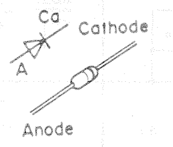
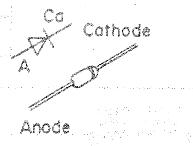
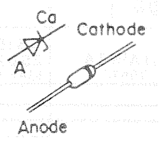
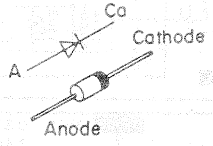
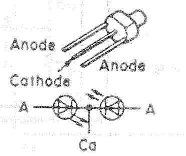
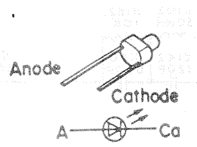
## E OPERATION P.C.B. (REP1921A–S)


≜ OPEN (DECK1)
DOLBY NR
REVERSE MODE
DECK 1/2
◀
◀◀ (TPS)
(TPS) ▶▶
▶
ONE TOUCH TAPE EDIT
NOR
HIGH
● REC PAUSE
CCRT
≜ OPEN (DECK2)
P901
S909
S910
S911
S912
S902
S901
Q902
S915
S908
IC901
Q901
S913
S904
S903
S914
S900
S906
S907
S905
D905 (◀)
D907 (▶)
(OUT)
(IN)
(DECK1)
(DECK2)
(REC)
(CCRT)
(DECK1) CLOSE
■
(DECK2) CLOSE
1301A–I

## MOTOR P.C.B. (REP1955A–T)

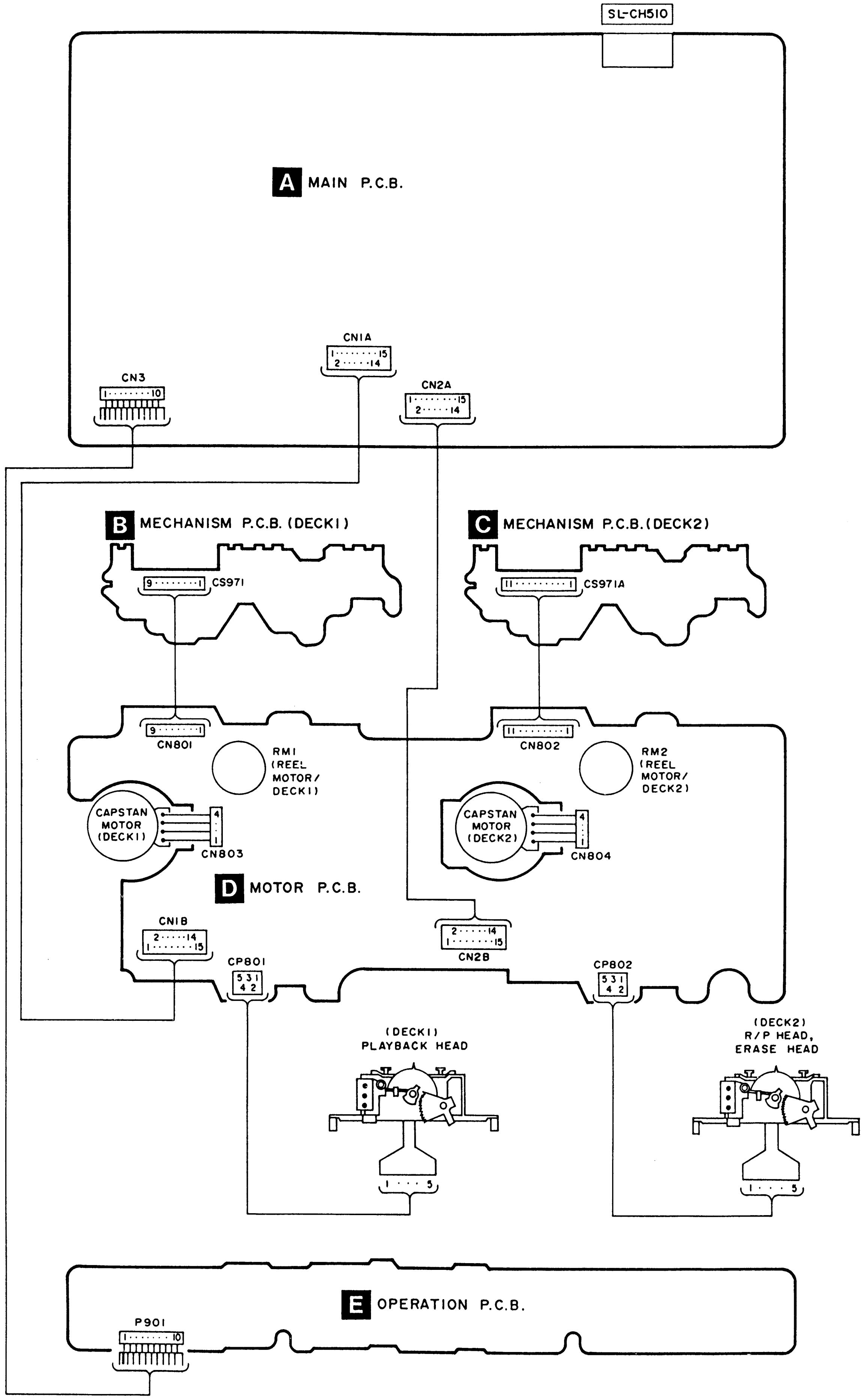

CP801
CN1B
IC1
CN2B
CP802
Q1
Q2
Q3
Q4
Q5
Q6
IC2
CN803
CN804
S801
S802
S803
S804
Q802
Q803
Q804
RM1 (REEL MOTOR/ DECK1)
CAPSTAN MOTOR (DECK2)
RM2 (REEL MOTOR/ DECK2)
IC801
IC802
Z801
Z802
CN801
CN802
VR802
VR803
1333A–1

### ● Terminal Guide of IC's, Transistors and Diodes

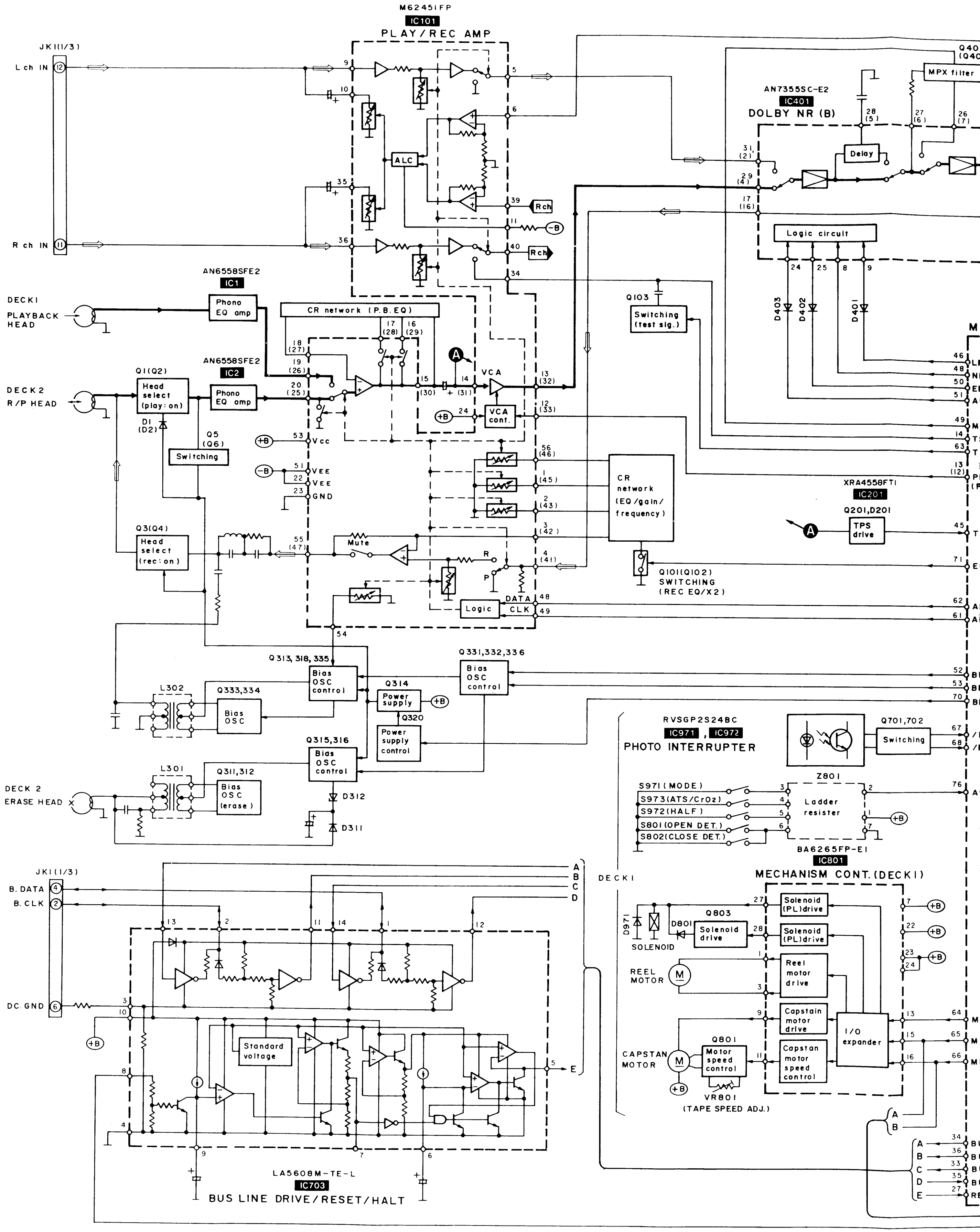
| | | | | |
|---|---|---|---|---|
| XRA4558FT1<br>XLJ93LC46AFE<br> | LA5608M-TE-L 14Pin<br>XLU2040F-T1 16Pin<br>AN7355SC-E2 32Pin<br>AN6558SFE2 8Pin<br> | <br>M62451FP 56Pin<br>M38062M4092F 80Pin | BA6265FP-E1<br> | |
| RVSGP2S24BC<br> | DTC114YSTP<br>DTC144ESTP<br> | <br>UN4219TA<br>2SA1309AIRTA<br>2SA1309A-R<br>2SC3311AIRTA<br>2SD1450RTA<br>UN4119 | 2SB621AQSTA<br>2SD592NCR<br> | 2SD2137PQTA<br> |
| 2SB1417PQTA<br> | 2SJ164PQRTA<br> | 2SK381BCDTA<br> | 1SS291TA<br> | <br>MA165<br>MA188TA<br>MA723TA<br>RVD1SS133TA |
| <br>MTZJ5R1BTA<br>MTZJ5R6CTA<br>MTZJ6R2CTA<br>MTZJ8R2CTA | RL1N4003N02<br> | SPR-305MDTF<br> | SLR-305VC<br> | |

8
5
1
4
No.1
28
14
15
Ca
C
E
A
B
D
G
S
Cathode
Anode

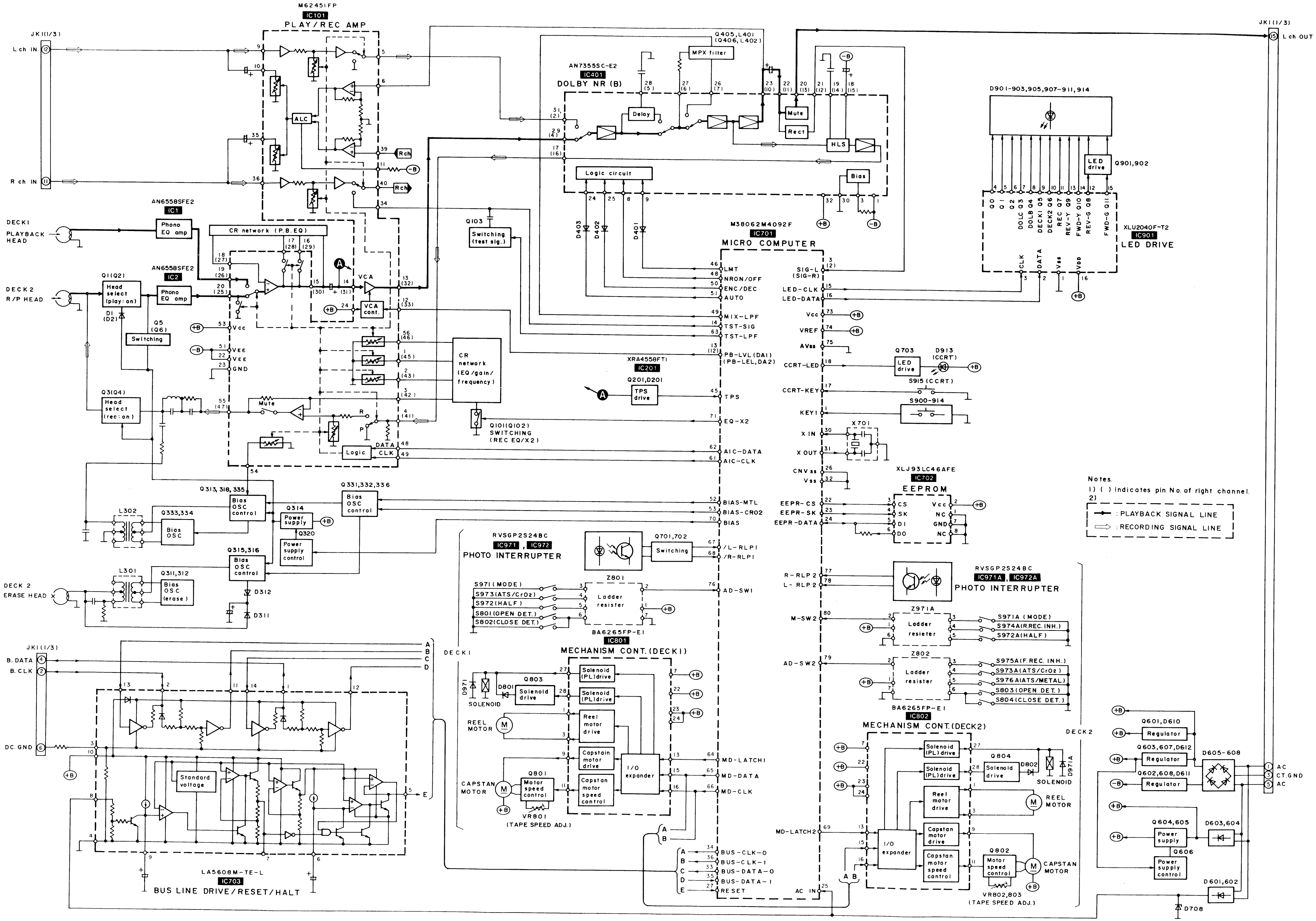
## ■ Wiring Connection Diagram


SL-CH510
A MAIN P.C.B.
CN3
CN1A
CN2A
B MECHANISM P.C.B. (DECK1)
CS971
C MECHANISM P.C.B. (DECK2)
CS971A
CN801
CN802
RM1 (REEL MOTOR/ DECK1)
RM2 (REEL MOTOR/ DECK2)
CAPSTAN MOTOR (DECK1)
CAPSTAN MOTOR (DECK2)
CN803
CN804
D MOTOR P.C.B.
CN1B
CN2B
CP801
CP802
(DECK1) PLAYBACK HEAD
(DECK2) R/P HEAD, ERASE HEAD
E OPERATION P.C.B.
P901

## ■ Block Diagram


M62451FP
IC101
PLAY/REC AMP
JK1(1/3)
L ch IN
R ch IN
ALC
R ch
B
AN6558SFE2
IC1
Phono EQ amp
DECK1 PLAYBACK HEAD
CR network (P.B.EQ)
AN6558SFE2
IC2
Phono EQ amp
Q1(Q2)
Head select (play: on)
DECK2 R/P HEAD
D1 (D2)
Q5 (Q6)
Switching
VCA
VCA cont.
Vcc
VEE
GND
Q3(Q4)
Head select (rec: on)
Mute
Logic
DATA
CLK
Q313, 318, 335
Bias osc control
L302
Q333,334
Bias osc
Q314
Power supply
Q320
Power supply control
Q331,332,336
Bias osc control
Q315,316
Bias osc control
L301
Q311,312
Bias osc (erase)
D312
D311
DECK 2 ERASE HEAD
AN7355SC-E2
IC401
DOLBY NR (B)
Delay
Logic circuit
MPX filter
D403
D402
D401
Q103
Switching (test sig.)
CR network (EQ/gain/ frequency)
Q101(Q102) SWITCHING (REC EQ/X2)
XRA4558FT1
IC201
Q201,D201
TPS drive
RVSGP2S248C
IC971, IC972
PHOTO INTERRUPTER
Q701,702
Switching
Z801
S971(MODE)
S973(ATS/CrO2)
S972(HALF)
S801(OPEN DET.)
S802(CLOSE DET.)
Ladder resister
BA6265FP-E1
IC801
MECHANISM CONT. (DECK1)
DECK1
D971
D801
Q803
SOLENOID
Solenoid (PL)drive
Solenoid drive
Solenoid (PL)drive
REEL MOTOR
Reel motor drive
Capstain motor drive
CAPSTAN MOTOR
Q801
Motor speed control
Capstan motor speed control
I/O expander
VR801 (TAPE SPEED ADJ.)
JK1(1/3)
B. DATA
B. CLK
DC GND
Standard voltage
LA5608M-TE-L
IC703
BUS LINE DRIVE/RESET/HALT
A
B
C
D
E

## ■ Block Diagram


M62451FP
IC101
PLAY/REC AMP
JK1(1/3)
Lch IN
Rch IN
ALC
Rch
Q405,L401 (Q406,L402)
MPX filter
AN7355SC-E2
IC401
DOLBY NR (B)
Delay
Mute
Rect
HLS
Logic circuit
Bias
L ch OUT
D901-903,905,907-911,914
LED drive
Q901,902
Q0
Q1
Q2
DOLC Q3
DOLB Q4
DECK1 Q5
DECK2 Q6
REC Q7
REV-Y Q9
FWD-Y Q10
REV-G Q8
FWD-G Q11
XLU2040F-T2
IC901
LED DRIVE
CLK
DATA
Vss
VDD
AN6558SFE2
IC1
DECK1 PLAYBACK HEAD
Phono EQ amp
CR network (P.B.EQ)
VCA
VCA cont.
Q103
Switching (test sig.)
D403
D402
D401
M38062M4092F
IC701
MICRO COMPUTER
LMT
NRON/OFF
ENC/DEC
AUTO
MIX-LPF
TST-SIG
TST-LPF
PB-LVL(DA1) (PB-LEL,DA2)
TPS
EQ-X2
AIC-DATA
AIC-CLK
BIAS-MTL
BIAS-CRO2
BIAS
/L-RLP1
/R-RLP1
AD-SW1
MD-LATCH1
MD-DATA
MD-CLK
BUS-CLK-O
BUS-CLK-I
BUS-DATA-O
BUS-DATA-I
RESET
AC IN
SIG-L (SIG-R)
LED-CLK
LED-DATA
Vcc
VREF
AVss
CCRT-LED
CCRT-KEY
KEY1
X IN
X OUT
CNVss
Vss
EEPR-CS
EEPR-SK
EEPR-DATA
R-RLP2
L-RLP2
M-SW2
AD-SW2
MD-LATCH2
Q703
LED drive
D913 (CCRT)
S915 (CCRT)
S900-914
X701
XLJ93LC46AFE
IC702
EEPROM
CS
SK
DI
DO
NC
GND
AN6558SFE2
IC2
DECK2 R/P HEAD
Q1(Q2)
Head select (play: on)
D1 (D2)
Q5 (Q6)
Switching
Vcc
VEE
GND
CR network (EQ/gain/frequency)
XRA4558FT1
IC201
Q201,D201
TPS drive
Q101(Q102) SWITCHING (REC EQ/X2)
Q3(Q4)
Head select (rec: on)
Mute
Logic
DATA
CLK
R
P
Q313,318,335
Bias osc control
Q331,332,336
Bias osc control
Q314
Power supply
Q320
Power supply control
L302
Q333,334
Bias osc
Q315,316
Bias osc control
L301
Q311,312
Bias osc (erase)
DECK 2 ERASE HEAD
D312
D311
RVSGP2S248C
IC971, IC972
PHOTO INTERRUPTER
Q701,702
Switching
S971(MODE)
S973(ATS/CrO2)
S972(HALF)
S801(OPEN DET.)
S802(CLOSE DET.)
Z801
Ladder resister
BA6265FP-E1
IC801
MECHANISM CONT.(DECK1)
DECK1
D971
D801
SOLENOID
Q803
Solenoid drive
Solenoid (PL) drive
REEL MOTOR
Reel motor drive
Capstan motor drive
Capstan motor speed control
I/O expander
CAPSTAN MOTOR
Q801
Motor speed control
VR801 (TAPE SPEED ADJ.)
RVSGP2S248C
IC971A, IC972A
PHOTO INTERRUPTER
Z971A
Ladder resieter
S971A (MODE)
S974A(R.REC. INH.)
S972A(HALF)
Z802
Ladder resister
S975A(F.REC. INH.)
S973A(ATS/CrO2)
S976A(ATS/METAL)
S803(OPEN DET.)
S804(CLOSE DET.)
BA6265FP-E1
IC802
MECHANISM CONT.(DECK2)
DECK2
Q804
Solenoid drive
D802
D971A
SOLENOID
REEL MOTOR
Q802
Motor speed control
CAPSTAN MOTOR
VR802,803 (TAPE SPEED ADJ.)
Q601,D610
Regulator
Q603,607,D612
Regulator
Q602,608,D611
Regulator
D605-608
AC
CT.GND
AC
Q604,605
Power supply
Q606
Power supply control
D603,604
D601,602
D708
JK1(1/3)
B.DATA
B.CLK
DC.GND
Standard voltage
LA5608M-TE-L
IC703
BUS LINE DRIVE/RESET/HALT
+B
-B
A
B
C
D
E

Notes.
1) ( ) indicates pin No. of right channel.
2) ━▶ : PLAYBACK SIGNAL LINE
⇨ : RECORDING SIGNAL LINE

## ■ Self-Check Function

**This unit incorporates a cassette mechanism self-check function using the DOLBY NR/REVERSE MODE LED indicators. Use this function during maintenance to check for faults in the items below.**

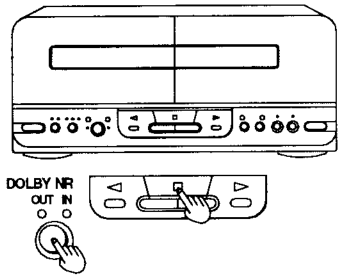
### ● Cassette tapes to be prepared

Metal tape: Recorded music tape with erase-prevention tab intact on one side removed from the other side (use middle portion of tape).

Normal tape:
CrO2 tape: } Recorded music tape with both erase-prevention tabs intact (use middle portion of tape).

### ● Selecting Self-Check Mode

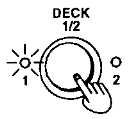
1. Turn on the power to the unit . (If RS-CH510 unit is removed from system, turn on power according to procedure on page 9.)
2. Check that no tape is inserted in the cassette deck.
   Press and hold the DOLBY NR button for about 2 seconds, then press the STOP button for about 2 seconds. (Self-Check mode cannot be selected with a tape loaded in the cassette deck.)



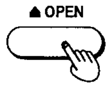
3. DOLBY NR and REVERSE MODE LED indicators turn off, and the LED indicator for either Deck 1 or Deck 2 flashes, indicating the self-check mode has been activated.

### ● Deck 1 Mechanism Check

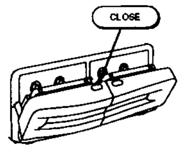
Use the Deck 1/2 select button to change the flashing Deck 2 indicator to Deck 1. (No change required if Deck 1 indicator already flashing.)



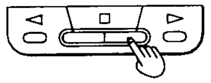
Open the Deck 1 cassette holder. (OPEN button)



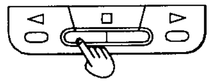
Insert a CrO2 tape into the Deck 1 and close the cassette holder. (CLOSE button)



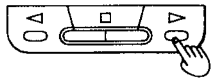
Press the TPS ▶▶ button. (Tape fast forwards for about 2 seconds then stops.)



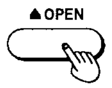
Press the ◀◀ TPS button. (Tape rewinds for about 2 seconds then stops.)



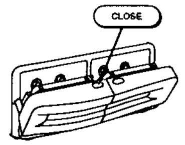
Press the PLAY button. (After TPS operation and check, the tape stops.)



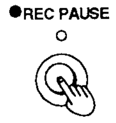
Open the Deck 1 cassette holder and replace the tape with a normal tape. (OPEN button)



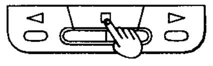
Close the Deck 1 cassette holder. (CLOSE button)



Press the REC/PAUSE button. (No record operation.)



Press the STOP button. Fault items 1 to 10 can be checked as the four LED indicators turn off or flash. (Refer to Table 1.) Each time the STOP button is pressed, the fault items are displayed in sequence.



∗If no fault, all indicators go out.

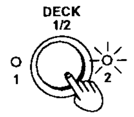
| No. | LED indicator status (off/flashing) | | | | Fault location |
|---|---|---|---|---|---|
| | DOLBY NR | REVERSE MODE | | | |
| | IN | ⇄ | ⥀ | ⥀⥁ | |
| 1. | — | — | — | ● | MODE detect switch |
| 2. | — | — | ● | — | REC prevention switch |
| 3. | — | — | ● | ● | Half detect switch |
| 4. | — | ● | — | — | Deck OPEN switch |
| 5. | — | ● | — | ● | Deck CLOSE switch |
| 6. | — | ● | ● | — | CrO2 tape detect switch |
| 7. | — | ● | ● | ● | Metal tape detect switch |
| 8. | ● | — | — | — | Reel pulse detect system (Hall IC, etc.) |
| 9. | ● | — | — | ● | TPS operation |
| 10. | ● | — | ● | — | Reel motor |

**Table 1**: Self-Check Mode Diagnostic Items

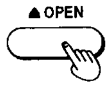
**Notes:**
" ● " : Flashing
" — " : off
∗If no fault, all indicators go out.

### ● Deck 2 Mechanism Check

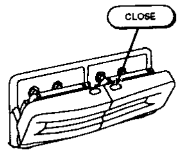
Use the Deck 1/2 select button to change the flashing Deck 1 indicator to Deck 2.



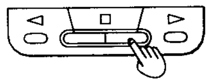
Open the Deck 2 cassette holder. (OPEN button)



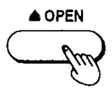
Insert a metal tape into the Deck 2 with an intact erase-prevention tab on the right side, and close the cassette holder. (CLOSE button)



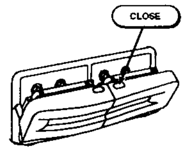
Press the TPS ▶▶ button. (Tape fast forwards for about 2 seconds then stops.)



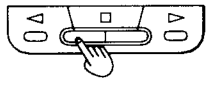
Open the Deck 2 cassette holder and turn over the metal tape (intact erase-prevention tab on the left side). (OPEN button)



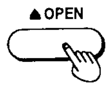
Close the Deck 2 cassette holder. (CLOSE button)



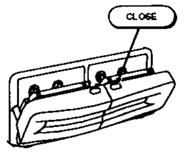
Press the ◀◀ TPS button. (Tape rewinds for about 2 seconds then stops.)



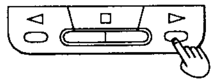
Open the Deck 2 cassette holder and replace the metal tape with a CrO2 tape. (OPEN button)



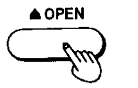
Close the Deck 2 cassette holder. (CLOSE button)



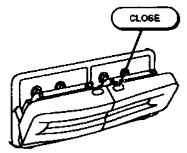
Press the PLAY button. (After TPS operation and check, the tape stop.)



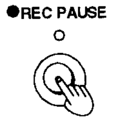
Open the Deck 2 cassette holder and replace the CrO2 tape with a normal tape. (OPEN button)



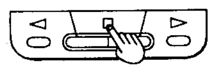
Close the Deck 2 cassette holder. (CLOSE button)



Press the REC/PAUSE button. (No record operation.)



Press the STOP button. Fault items 1 to 10 can be checked as the four LED indicators turn off or flash. (Refer to Table 1.) Each time the STOP button is pressed, the fault items are displayed in sequence.



∗If no fault, all indicators go out.

● Exiting S

1. Press the

2. Remove t
3. Turn off t

## ■ Func

●IC702 (XL

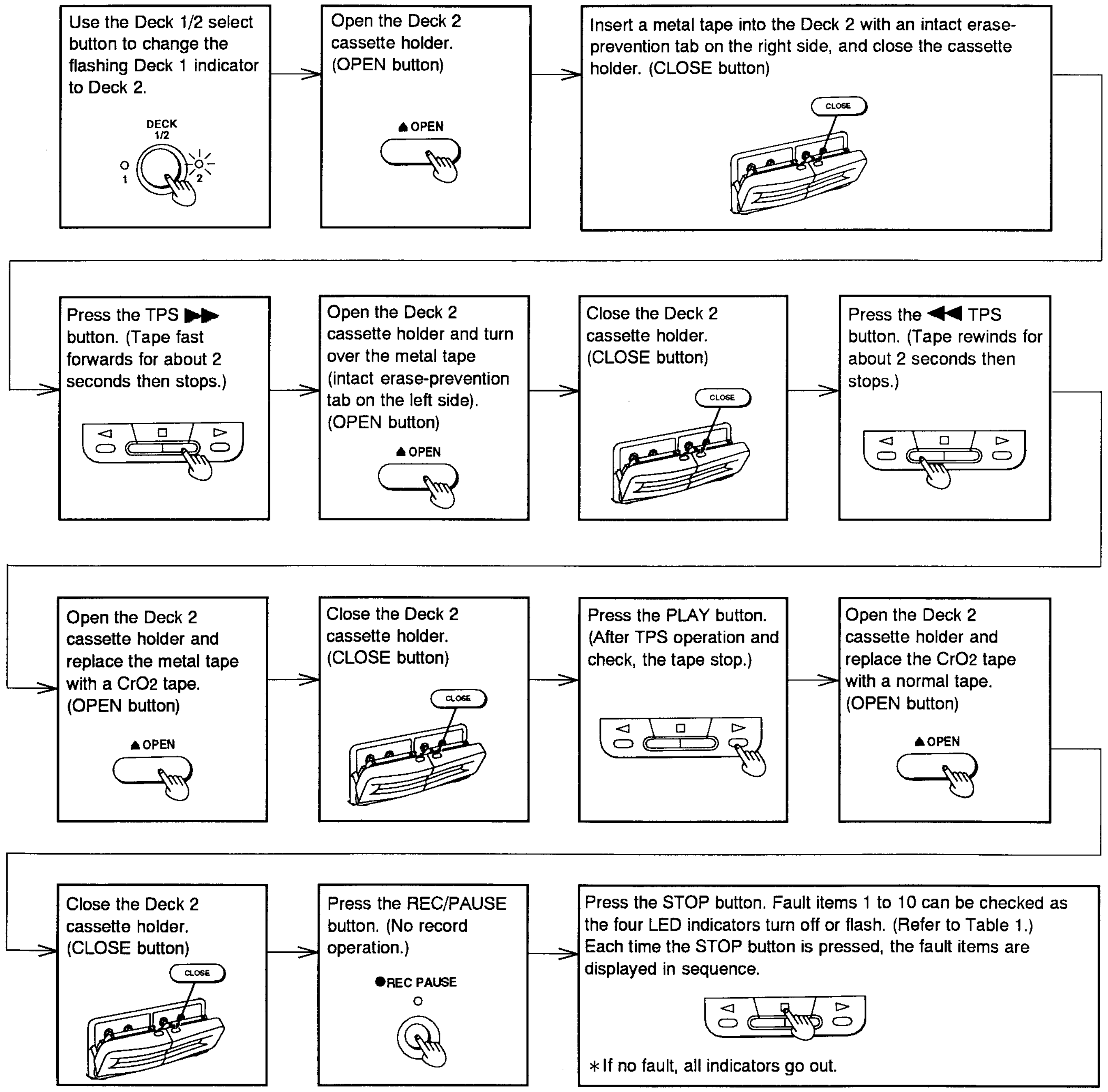
| Pin No. | Termi Nam |
|---|---|
| 1 | NC |
| 2 | Vc |
| 3 | CS |
| 4 | SK |
| 5 | DI |
| 6 | D |
| 7 | GN |
| 8 | NC |

| No. | LED indicator status (off/flashing) |  |  |  | Fault location |
|---|---|---|---|---|---|
|  | DOLBY NR | REVERSE MODE |  |  |  |
|  | IN | ⇄ | ↺ | ↺↻ |  |
| 1. | — | — | — | ● | MODE detect switch |
| 2. | — | — | ● | — | REC prevention switch |
| 3. | — | — | ● | ● | Half detect switch |
| 4. | — | ● | — | — | Deck OPEN switch |
| 5. | — | ● | — | ● | Deck CLOSE switch |
| 6. | — | ● | ● | — | $CrO_2$ tape detect switch |
| 7. | — | ● | ● | ● | Metal tape detect switch |
| 8. | ● | — | — | — | Reel pulse detect system (Hall IC, etc.) |
| 9. | ● | — | — | ● | TPS operation |
| 10. | ● | — | ● | — | Reel motor |

**Table 1**: Self-Check Mode Diagnostic Items

**Notes:**
" ● " : Flashing
" — " : off
∗If no fault, all indicators go out.

### • Deck 2 Mechanism Check



Use the Deck 1/2 select button to change the flashing Deck 1 indicator to Deck 2.

Open the Deck 2 cassette holder. (OPEN button)

Insert a metal tape into the Deck 2 with an intact erase-prevention tab on the right side, and close the cassette holder. (CLOSE button)

Press the TPS ▶▶ button. (Tape fast forwards for about 2 seconds then stops.)

Open the Deck 2 cassette holder and turn over the metal tape (intact erase-prevention tab on the left side). (OPEN button)

Close the Deck 2 cassette holder. (CLOSE button)

Press the ◀◀ TPS button. (Tape rewinds for about 2 seconds then stops.)

Open the Deck 2 cassette holder and replace the metal tape with a $CrO_2$ tape. (OPEN button)

Close the Deck 2 cassette holder. (CLOSE button)

Press the PLAY button. (After TPS operation and check, the tape stop.)

Open the Deck 2 cassette holder and replace the $CrO_2$ tape with a normal tape. (OPEN button)

Close the Deck 2 cassette holder. (CLOSE button)

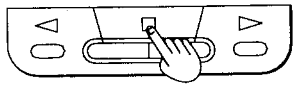
Press the REC/PAUSE button. (No record operation.)

Press the STOP button. Fault items 1 to 10 can be checked as the four LED indicators turn off or flash. (Refer to Table 1.) Each time the STOP button is pressed, the fault items are displayed in sequence.

∗If no fault, all indicators go out.

### • Exiting Self-Check Mode

1. Press the STOP button for more than 5 seconds. (Diagnostic contents stored in memory for both Deck 1 and 2 are erased.)



2. Remove the cassette tape from the cassette holder.
3. Turn off the unit.

## ■ Function of IC Terminals

### •IC702 (XLJ93LC46AFE)

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | NC | — | Connected to GND |
| 2 | Vcc | I | Power input |
| 3 | CS | I | Chip select signal input |
| 4 | SK | I | Serial clock input |
| 5 | DI | I | Serial data input |
| 6 | DO | O | Serial data output |
| 7 | GND | — | GND |
| 8 | NC | — | Connected to GND |

### •IC801 and IC802 (BA6265FP-E1)

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | RM– | O | Reel motor control (–) |
| 2 | GND | — | Reel motor GND |
| 3 | RM+ | O | Reel motor control (+) |
| 4 ~ 6 | NC | — | Connected to GND |
| 7 | 7.5 V | I | Power input (7.5 V) |
| 8 | GND | — | Capstan motor GND |
| 9 | CPM | O | Capstan motor control |
| 10 | NC | — | Connected to GND |
| 11 | CPM-SW | O | Capstan motor speed control |
| 12 | NC | — | Connected to GND |
| 13 | LACH | I | I/O expandor lach signal output |
| 14 | S.O. | O | I/O expandor serial output |
| 15 | DATA | I | I/O expandor data input |
| 16 | CLK | I | I/O expandor clock input |
| 17, 18 | NC | — | Connected to CLK |
| 19 | NC | — | Connected to LACH |
| 20, 21 | GND | — | GND |
| 22 | 5 V | I | Power input (5 V) |
| 23, 24 | 15 V | I | Power input (15 V) |
| 25 | NC | — | Connected to GND |
| 26 | GND | — | GND |
| 27 | PL15 V | O | Plunger drive signal output (15 V) |
| 28 | PL7.5 V | O | Plunger drive signal output (7.5 V) |

- **IC701 (M38062M4092F)**

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | KEY1 | I | Operation key input |
| 2 | SIG-R | I | Level detection input for audio signal (R-ch) |
| 3 | SIG-L | I | Level detection input for audio signal (L-ch) |
| 4 ~ 11 | — | — | Unused, connected to GND |
| 12 | PB-LVL (DA2) | O | Control signal output for playback level (R-ch) |
| 13 | PB-LVL (DA1) | O | Control signal output for playback level (L-ch) |
| 14 | TST-SIG | O | Audio test signal output (400 Hz/10 kHz) |
| 15 | LED-CLK | O | Serial clock signal output for LED drive control to IC901 |
| 16 | LED-DATA | O | Serial data signal output for LED drive control to IC901 |
| 17 | CCRT-KEY | I | Key input for CCRT |
| 18 | CCRT-LED | O | ON/OFF control signal output for CCRT display to LED |
| 19 ~ 21 | — | — | Unused, connected to GND |
| 22 | EEPR-CS | O | Chip select signal output for EEPROM |
| 23 | EEPR-SK | O | Serial clock signal output for EEPROM |
| 24 | EEPR-DATA | I/O | Serial data signal input/output for EEPROM |
| 25 | ACIN | I | Signal input for power OFF mode detection |
| 26 | CNVSS | — | Connected to Vss |
| 27 | /RESET | I | Reset signal input from IC703 |
| 28<br>29 | — | — | Unused, connected to GND |
| 30 | XIN | I | Connected to a oscillator X701 (8 MHz) |
| 31 | XOUT | O | |
| 32 | VSS | — | Connected to GND |
| 33 | BUS DATA-0 | O | Bus data signal output |
| 34 | BUS CLK-0 | O | Bus clock signal output |
| 35 | BUS DATA-1 | I | Bus data signal input |
| 36 | BUS CLK-1 | I | Bus clock signal input |
| 37 ~ 40 | — | — | Unused, connected to GND |
| 41 | TST-EPROM | I | Signal input for EEPROM initialization |
| 42 | TST-MODE | I | Switching signal input for Test ON/OFF mode |
| 43 | CS-KEY | I | Connected to GND |
| 44 | CS-NR | I | Model selection input (This unit ; "L") |
| 45 | TPS | I | Detection signal input for tape music search presence signal in TPS operation |
| 46 | LMT | O | Muting signal output for line out |
| 47 | DOLBY B/C | O | Dolby B/C switching signal output |
| 48 | NR ON/OFF | O | Dolby ON/OFF switching signal output |
| 49 | MIX-LPF | O | Filter ON/OFF switching signal output in audio signal level detection |
| 50 | ENC/DEC | O | Encoder/decoder switching signal |
| 51 | AUTO | O | Gain control signal output for audio signal level detection circuit |
| 52 | BIAS-MTL | O | Control signal output for recording bias in use of a metal tape |
| 53 | BIAS-CRO2 | O | Control signal output for recording bias in use of a Chrome tape |
| 54 ~ 59 | — | — | Unused, connected to GND |
| 60 | TEST "L" | O | Connected to GND |
| 61 | AIC-CLK | O | Clock control signal output to IC for audio recording/playback |
| 62 | AIC-DATA | O | Data control signal output to IC for audio recording/playback |
| 63 | TST-LPF | O | Filter ON/OFF switching signal output for CCRT recording test signal (400 Hz: "H") |
| 64 | MD LATCH1 | O | Latch signal output to IC801 for mechanism drive on deck 1 |
| 65 | MD-DATA | O | Serial data signal output to mechanism drive ICs (IC801, IC802) |
| 66 | MD-CLK | O | Serial clock signal output to mechanism ICs (IC801, 802) |
| 67 | /L-RLP1 | I | Pulse signal input for rotation detection to left side reel of deck 1 |
| 68 | /R-RLP1 | I | Pulse signal input for rotation detection to right side reel of deck 1 |
| 69 | MD-LATCH2 | O | Latch signal output to IC802 for mechanism drive on deck 2 |
| 70 | BIAS | O | ON/OFF switching signal output for recording bias |
| 71 | EQ-X2 | O | Switching signal output for recording equalizer |
| 72 | — | — | Unused, connected to GND |
| 73 | Vcc | — | Connected to power source (+5V) |
| 74 | VREF | — | Connected to reference voltage for A/D input |
| 75 | AVSS | — | Connected to GND |
| 76 | VREF | — | Standard voltage for A/D convertor (Connected to VCC) |
| 77 | R-RLP2 | I | Pulse signal input for rotation detection to right side reel of deck 2 |
| 78 | L-RLP2 | I | Pulse signal input for rotation detection to left side reel of deck 2 |
| 79 | AD-SW2 | I | Signal input for mechanism switches for deck 2 |
| 80 | M-SW2 | I | Signal input for mechanism switches for deck 2 |

# ■ Replacement Parts List

**Notes:** •Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
•The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
•The "(SF)" mark denotes the standard part.

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | INTEGRATED CIRCUIT(S) | |
| | | | |
| IC1, 2 | AN6558SFE2 | IC, P.B EQ AMP. | |
| IC101 | M62451FP | IC, REC/PLAYBACK AMP. | |
| IC201 | XRA4558FT1 | IC, TPS DRIVE | |
| IC401 | AN7355SC-E2 | IC, DOLBY NR | |
| IC701 | M38062M4092F | IC, MICRO COMPUTER | |
| IC702 | XLJ93LC46AFE | IC, EEPROM | |
| IC703 | LA5608M-TE-L | IC, BUS LINE/HALT/RESET | |
| IC801, 802 | BA6265FP-E1 | IC, MECHANISM CONTROL | |
| IC901 | XLU2040F-T1 | IC, LED DRIVE | |
| IC971 | RVSGP2S24BC | PHOTO INTERRUPTER(DECK1) | |
| IC971A | RVSGP2S24BC | PHOTO INTERRUPTER(DECK2) | |
| IC972 | RVSGP2S24BC | PHOTO INTERRUPTER(DECK1) | |
| IC972A | RVSGP2S24BC | PHOTO INTERRUPTER(DECK2) | |
| | | | |
| | | TRANSISTOR(S) | |
| | | | |
| Q1, 2 | 2SJ164PQRTA | TRANSISTOR | |
| Q3, 4 | 2SK381BCDTA | TRANSISTOR | |
| Q5, 6 | 2SD1450RTA | TRANSISTOR | |
| Q101, 102 | 2SC3311AIRTA | TRANSISTOR | |
| Q103 | DTC144ESTP | TRANSISTOR | |
| Q201 | 2SC3311AIRTA | TRANSISTOR | |
| Q311, 312 | 2SC3311AIRTA | TRANSISTOR | |
| Q313 | 2SB621AQSTA | TRANSISTOR | |
| Q314 | 2SA1309AIRTA | TRANSISTOR | |
| Q315 | 2SD2137PQTA | TRANSISTOR | |
| Q316 | 2SC3311AIRTA | TRANSISTOR | |
| Q318 | 2SA1309AIRTA | TRANSISTOR | |
| Q320 | DTC144ESTP | TRANSISTOR | |
| Q331, 332 | UN4219TA | TRANSISTOR | |
| Q333, 334 | 2SC3311AIRTA | TRANSISTOR | |
| Q335 | 2SD592NCR | TRANSISTOR | |
| Q336 | DTC144ESTP | TRANSISTOR | |
| Q405, 406 | 2SC3311AIRTA | TRANSISTOR | |
| Q601 | 2SD2137PQTA | TRANSISTOR | ⚠ |
| Q602 | 2SB1417PQTA | TRANSISTOR | ⚠ |
| Q603 | 2SD2137PQTA | TRANSISTOR | ⚠ |
| Q604, 605 | 2SD2137PQTA | TRANSISTOR | |
| Q606 | 2SC3311AIRTA | TRANSISTOR | |
| Q607 | 2SD2137PQTA | TRANSISTOR | ⚠ |
| Q608 | 2SB1417PQTA | TRANSISTOR | ⚠ |
| Q701, 702 | DTC114YSTP | TRANSISTOR | |
| Q703 | UN4219TA | TRANSISTOR | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| Q801, 802 | 2SA1309A-R | TRANSISTOR | |
| Q803, 804 | 2SD1450RTA | TRANSISTOR | |
| Q901, 902 | UN4119 | TRANSISTOR | |
| | | | |
| | | DIODE(S) | |
| | | | |
| D1, 2 | MA188TA | DIODE | |
| D201 | MA165 | DIODE | |
| D302 | MA165 | DIODE | |
| D311 | MA188TA | DIODE | |
| D312 | MTZJ5R6CTA | DIODE | |
| D313 | MA165 | DIODE | |
| D351, 352 | MA165 | DIODE | |
| D401-403 | MA165 | DIODE | |
| D601, 602 | MA165 | DIODE | ⚠ |
| D603-608 | RL1N4003N02 | DIODE | ⚠ |
| D609 | MA723TA | DIODE | |
| D610, 611 | MTZJ8R2CTA | DIODE | ⚠ |
| D612 | MTZJ6R2CTA | DIODE | ⚠ |
| D613 | MA723TA | DIODE | |
| D701 | 1SS291TA | DIODE | |
| D702 | MA165 | DIODE | |
| D703 | 1SS291TA | DIODE | |
| D704, 705 | MA165 | DIODE | |
| D708 | MTZJ5R1BTA | DIODE | ⚠ |
| D709, 710 | MA165 | DIODE | |
| D801, 802 | MA188TA | DIODE | |
| D901-903 | SLR-305VC | LED | |
| D904 | MA165 | DIODE | |
| D905 | SPR-305MDTF | LED | |
| D906 | MA165 | DIODE | |
| D907 | SPR-305MDTF | LED | |
| D908-911 | SLR-305VC | LED | |
| D913, 914 | SLR-305VC | LED | |
| D971 | RVD1SS133TA | DIODE(DECK1) | |
| D971A | RVD1SS133TA | DIODE(DECK2) | |
| | | | |
| | | VARIABLE RESISTOR(S) | |
| | | | |
| VR801 | EVNDCAA03B53 | TAPE SPEED ADJ(DECK1)NORMAL | |
| VR802 | EVNDCAA03B53 | TAPE SPEED ADJ(DECK2)HIGH | |
| VR803 | EVNDCAA03B53 | TAPE SPEED ADJ(DECK2)NORMAL | |
| | | | |
| | | COMPONENT COMBINATION(S) | |
| | | | |
| Z801, 802 | EXBF7L355SYV | COMPONENT COMBINATION | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| Z971A | EXBF6L306SYV | COMPONENT COMBINATION | |
| | | | |
| | | COIL(S) | |
| | | | |
| L101, 102 | SLQX303-1KT | COIL | |
| L301, 302 | SL09B4-K | COIL | |
| L401, 402 | RLQB103JT-Y | COIL | |
| L701 | RLQA100JT-Y | COIL | |
| | | | |
| | | OSCILLATOR(S) | |
| | | | |
| X701 | EF0EC8004T4 | OSCILLATOR(8MHz) | |
| | | | |
| | | SWITCH(ES) | |
| | | | |
| S801 | RSH1A024-U | SW, HOLDER OPEN DET. (DECK1) | |
| S802 | RSH1A024-U | SW, HOLDER CLOSE DET. (DECK1) | |
| S803 | RSH1A024-U | SW, HOLDER OPEN DET. (DECK2) | |
| S804 | RSH1A024-U | SW, HOLDER CLOSE DET. (DECK2) | |
| S900 | EVQ21405R | SW, STOP | |
| S901 | EVQ21405R | SW, FF(TPS) | |
| S902 | EVQ21405R | SW, REW(TPS) | |
| S903 | EVQ21405R | SW, FWD PLAY | |
| S904 | EVQ21405R | SW, REV PLAY | |
| S905 | EVQ21405R | SW, REC PAUSE | |
| S906 | EVQ21405R | SW, TAPE EDIT(NORMAL) | |
| S907 | EVQ21405R | SW, TAPE EDIT(HIGH) | |
| S908 | EVQ21405R | SW, HOLDER OPEN(DECK2) | |
| S909 | EVQ21405R | SW, HOLDER OPEN(DECK1) | |
| S910 | EVQ21405R | SW, DOLBY NR | |
| S911 | EVQ21405R | SW, REVERSE MODE | |
| S912 | EVQ21405R | SW, DECK1/2 SELECT | |
| S913 | EVQ21405R | SW, HOLDER CLOSE(DECK1) | |
| S914 | EVQ21405R | SW, HOLDER CLOSE(DECK2) | |
| S915 | EVQ21405R | SW, CCRT | |
| S971 | RSH1A018-U | SW, MODE(DECK1) | |
| S971A | RSH1A018-U | SW, MODE(DECK2) | |
| S972 | RSH1A019-U | SW, HALF(DECK1) | |
| S972A | RSH1A019-U | SW, HALF(DECK2) | |
| S973 | RSH1A019-U | SW, ATS/Cr02(DECK1) | |
| S973A | RSH1A019-U | SW, ATS/Cr02(DECK2) | |
| S974A | RSH1A019-U | SW, R. REC. INH(DECK2) | |
| S975A | RSH1A019-U | SW, F. REC. INH(DECK2) | |
| S976A | RSH1A019-U | SW, ATS/METAL(DECK2) | |
| | | | |
| | | CONNECTOR(S) | |
| | | | |
| CN1A | RJS1A6815 | SOCKET(15P) | |
| CN2A | RJS1A6815 | SOCKET(15P) | |
| CN1B | RJS1A6715-Q | SOCKET(15P) | |
| CN2B | RJS1A6715-Q | SOCKET(15P) | |
| CN3 | RJS10T4ZA | SOCKET(10P) | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| CN801 | RJT071H09A | CONNECTOR(9P) | |
| CN802 | RJT071H11A | CONNECTOR(11P) | |
| CN803, 804 | RJR0113 | CONNECTOR(MOTOR) | |
| CS971 | RJU071H09M | SOCKET(9P) | |
| CS971A | RJU071H11M | SOCKET(11P) | |
| CP801, 802 | RJS2A0205-2S | SOCKET(5P) | |
| | | | |
| | | GND PLATE | |
| | | | |
| E1 | SNE1004-2 | GND PLATE | |
| | | | |
| | | JACK | |
| | | | |
| JK1 | RJT065K15 | SYSTEM CONNECTOR | |

Notes : • Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads(pF) F=Farads(F)
• Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| | | |
| | | RESISTORS |
| | | |
| R3, 4 | ERDS2TJ101 | 1/4W 100 |
| R5, 6 | ERDS2TJ391 | 1/4W 390 |
| R7, 8 | ERDS2TJ103 | 1/4W 10K |
| R9 | ERDS2TJ224T | 1/4W 220K |
| R10 | ERDS2TJ224T | 1/4W 220K |
| R11, 12 | ERDS2TJ101 | 1/4W 100 |
| R13, 14 | ERDS2TJ391 | 1/4W 390 |
| R15, 16 | ERDS2TJ103 | 1/4W 10K |
| R17-20 | ERDS2TJ225 | 1/4W 2.2M |
| R21 | ERDS2TJ472 | 1/4W 4.7K |
| R109, 110 | ERDS2TJ151 | 1/4W 150 |
| R111, 112 | ERDS2TJ472 | 1/4W 4.7K |
| R113, 114 | ERDS2TJ272T | 1/4W 2.7K |
| R115, 116 | ERDS2TJ224T | 1/4W 220K |
| R117, 118 | ERDS2TJ682T | 1/4W 6.8K |
| R119, 120 | ERDS2TJ152 | 1/4W 1.5K |
| R121-124 | ERDS2TJ104 | 1/4W 100K |
| R125, 126 | ERDS2TJ822 | 1/4W 8.2K |
| R127, 128 | ERDS2TJ153 | 1/4W 15K |
| R129, 130 | ERDS2TJ473 | 1/4W 47K |
| R131, 132 | ERDS2TJ223 | 1/4W 22K |
| R133, 134 | ERDS2TJ151 | 1/4W 150 |
| R135-138 | ERDS2TJ271 | 1/4W 270 |
| R139, 140 | ERDS2TJ123 | 1/4W 12K |
| R141, 142 | ERDS2TJ222 | 1/4W 2.2K |
| R143 | ERDS2TJ475T | 1/4W 4.7M |
| R144 | ERDS2TJ331 | 1/4W 330 |
| R145 | ERDS2TJ104 | 1/4W 100K |
| R146 | ERDS2TJ472 | 1/4W 4.7K |
| R147, 148 | ERDS2TJ222 | 1/4W 2.2K |
| R149 | ERDS2TJ471 | 1/4W 470 |
| R151, 152 | ERDS2TJ103 | 1/4W 10K |
| R155, 156 | ERDS2TJ150T | 1/4W 15 |
| R157, 158 | ERDS2TJ180T | 1/4W 18 |
| R159, 160 | ERDS2TJ100 | 1/4W 10 |
| R161, 162 | ERDS2TJ182 | 1/4W 1.8K |
| R163, 164 | ERDS2TJ151 | 1/4W 150 |
| R165, 166 | ERDS2TJ182 | 1/4W 1.8K |
| R167, 168 | ERDS2TJ151 | 1/4W 150 |
| R169 | ERDS2TJ473 | 1/4W 47K |
| R201, 202 | ERDS2TJ223 | 1/4W 22K |
| R203 | ERDS2TJ331 | 1/4W 330 |
| R204 | ERDS2TJ472 | 1/4W 4.7K |
| R205 | ERDS2TJ823T | 1/4W 82K |
| R206 | ERDS2TJ682T | 1/4W 6.8K |
| R207 | ERDS2TJ393 | 1/4W 39K |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| R208 | ERDS2TJ102 | 1/4W 1K |
| R209, 210 | ERDS2TJ153 | 1/4W 15K |
| R301 | ERDS2TJ1R0 | 1/4W 1.0 |
| R302, 303 | ERDS2TJ103 | 1/4W 10K |
| R304, 305 | ERDS2TJ100 | 1/4W 10 |
| R307 | ERDS2TJ153 | 1/4W 15K |
| R308 | ERDS2TJ473 | 1/4W 47K |
| R309 | ERDS2TJ272T | 1/4W 2.7K |
| R310 | ERDS2TJ472 | 1/4W 4.7K |
| R331 | ERDS2TJ561 | 1/4W 560 |
| R332 | ERDS2TJ680T | 1/4W 68 |
| R333 | ERDS2TJ103 | 1/4W 10K |
| R334 | ERDS2TJ563 | 1/4W 56K |
| R335 | ERDS2TJ562 | 1/4W 5.6K |
| R337, 338 | ERDS2TJ393 | 1/4W 39K |
| R340 | ERD2FCVG150T | 1/4W 15 ⚠ |
| R351 | ERDS2TJ471 | 1/4W 470 |
| R352 | ERDS2TJ821 | 1/4W 820 |
| R353 | ERDS2TJ333 | 1/4W 33K |
| R354, 355 | ERDS2TJ270T | 1/4W 27 |
| R356, 357 | ERDS2TJ562 | 1/4W 5.6K |
| R358 | ERDS2TJ272T | 1/4W 2.7K |
| R371 | ERDS2TJ102 | 1/4W 1K |
| R401, 402 | ERDS2TJ272T | 1/4W 2.7K |
| R403, 404 | ERDS2TJ562 | 1/4W 5.6K |
| R405, 406 | ERDS2TJ682T | 1/4W 6.8K |
| R407 | ERDS2TJ222 | 1/4W 2.2K |
| R408 | ERDS2TJ223 | 1/4W 22K |
| R409, 410 | ERDS2TJ104 | 1/4W 100K |
| R411, 412 | ERDS2TJ221 | 1/4W 220 |
| R413, 414 | ERDS2TJ104 | 1/4W 100K |
| R415, 416 | ERDS2TJ123 | 1/4W 12K |
| R417, 418 | ERDS2TJ394 | 1/4W 390K |
| R421-424 | ERDS2TJ680T | 1/4W 68 |
| R426 | ERDS2TJ103 | 1/4W 10K |
| R427, 428 | ERDS2TJ153 | 1/4W 15K |
| R601, 602 | ERDS2TJ472 | 1/4W 4.7K |
| R603 | ERDS2TJ331 | 1/4W 330 |
| R604 | ERDS2TJ561 | 1/4W 560 |
| R605 | ERD2FCVJ4R7T | 1/4W 4.7 ⚠ |
| R606 | ERD2FCVJ5R6T | 1/4W 5.6 ⚠ |
| R607 | ERD2FCVG100T | 1/4W 10 ⚠ |
| R609 | ERDS2TJ100 | 1/4W 10 |
| R610 | ERDS2TJ152 | 1/4W 1.5K |
| R611, 612 | ERDS2TJR47T | 1/4W 0.47 |
| R614 | ERDS2TJ222 | 1/4W 2.2K |
| R615 | ERDS2TJ332 | 1/4W 3.3K |
| R616 | ERDS2TJ103 | 1/4W 10K |
| R618, 619 | ERDS2TJR47T | 1/4W 0.47 |

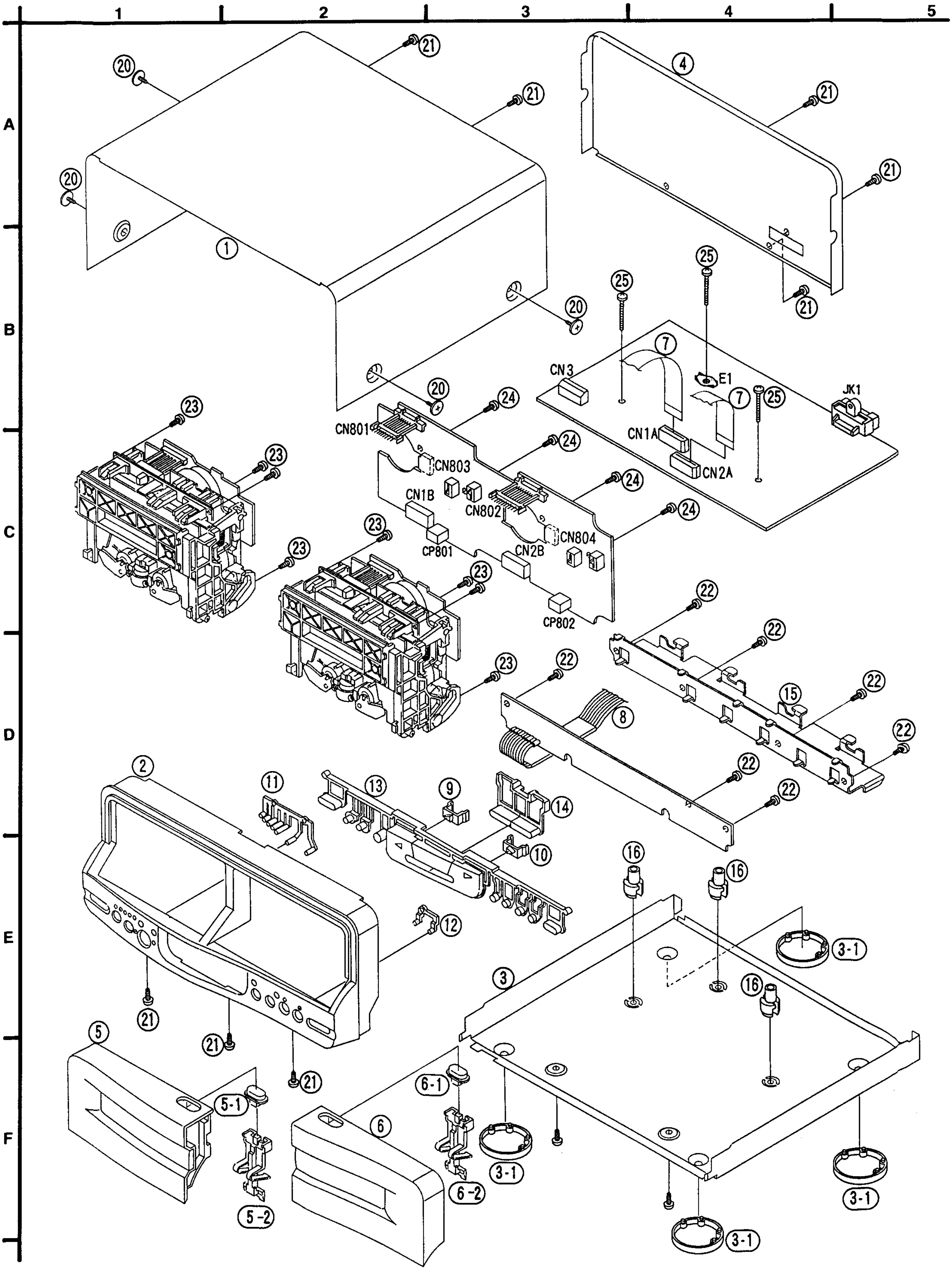
| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| R625 | ERDS2TJ100 | 1/4W 10 |
| R626, 627 | ERDS2TJR47T | 1/4W 0.47 |
| R701 | ERDS2TJ470 | 1/4W 47 |
| R702 | ERDS2TJ103 | 1/4W 10K |
| R703 | ERDS2TJ104 | 1/4W 100K |
| R704-710 | ERDS2TJ103 | 1/4W 10K |
| R712 | ERDS2TJ103 | 1/4W 10K |
| R714-730 | ERDS2TJ103 | 1/4W 10K |
| R731-733 | ERDS2TJ104 | 1/4W 100K |
| R734 | ERDS2TJ472 | 1/4W 4.7K |
| R736-738 | ERDS2TJ103 | 1/4W 10K |
| R740 | ERDS2TJ103 | 1/4W 10K |
| R741-744 | ERDS2TJ272T | 1/4W 2.7K |
| R745, 746 | ERDS2TJ104 | 1/4W 100K |
| R747, 748 | ERDS2TJ103 | 1/4W 10K |
| R751, 752 | ERDS2TJ272T | 1/4W 2.7K |
| R777 | ERDS2TJ103 | 1/4W 10K |
| R801, 802 | ERDS2TJ2R2T | 1/4W 2.2 |
| R803 | ERDS2TJ153 | 1/4W 15K |
| R804 | ERDS2TJ103 | 1/4W 10K |
| R805 | ERDS2TJ392T | 1/4W 3.9K |
| R806 | ERDS2TJ123 | 1/4W 12K |
| R807 | ERDS2TJ103 | 1/4W 10K |
| R808 | ERDS2TJ392T | 1/4W 3.9K |
| R811, 812 | ERDS2TJ474 | 1/4W 470K |
| R819 | ERDS2TJ271 | 1/4W 270 |
| R900 | ERDS2TJ821 | 1/4W 820 |
| R901 | ERDS2TJ102 | 1/4W 1K |
| R902 | ERDS2TJ122 | 1/4W 1.2K |
| R903 | ERDS2TJ152 | 1/4W 1.5K |
| R904 | ERDS2TJ182 | 1/4W 1.8K |
| R905 | ERDS2TJ222 | 1/4W 2.2K |
| R906 | ERDS2TJ332 | 1/4W 3.3K |
| R907 | ERDS2TJ472 | 1/4W 4.7K |
| R908 | ERDS2TJ682T | 1/4W 6.8K |
| R909 | ERDS2TJ123 | 1/4W 12K |
| R910 | ERDS2TJ223 | 1/4W 22K |
| R911 | ERDS2TJ683 | 1/4W 68K |
| R912, 913 | ERDS2TJ102 | 1/4W 1K |
| R914-917 | ERDS2TJ471 | 1/4W 470 |
| R918-920 | ERDS2TJ102 | 1/4W 1K |
| R921, 922 | ERDS2TJ272T | 1/4W 2.7K |
| R923 | ERDS2TJ102 | 1/4W 1K |
| R1009 | ERDS2TJ332 | 1/4W 3.3K |
| | | |
| | | CAPACITORS |
| | | |
| C1, 2 | ECBA1H681KB5 | 50V 680P |
| C3, 4 | ECBT1H101KB5 | 50V 100P |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| C5, 6 | ECBT1E103ZF | 25V 0.01U |
| C7, 8 | ECEA1EKA4R7B | 25V 4.7U |
| C9 | ECBA1H681KB5 | 50V 680P |
| C10 | ECBA1H681KB5 | 50V 680P |
| C11, 12 | ECBT1H101KB5 | 50V 100P |
| C13, 14 | ECBT1E103ZF | 25V 0.01U |
| C15, 16 | ECEA1EKA4R7B | 25V 4.7U |
| C17, 18 | ECBT1H102KB5 | 50V 1000P |
| C19, 20 | ECBT1H4R7KC5 | 50V 4.7P |
| C21, 22 | ECBT1H102KB5 | 50V 1000P |
| C101 | RCE1AM471BV | 10V 470U |
| C102 | ECEA1CKA100B | 16V 10U |
| C103, 104 | ECQB1H153JF3 | 50V 0.015U |
| C105, 106 | ECEA0JKA101B | 6.3V 100U |
| C107, 108 | ECEA1CKA100B | 16V 10U |
| C109, 110 | ECEA1HKAR47B | 50V 0.47U |
| C111, 112 | ECEA1AKA220B | 10V 22U |
| C113, 114 | ECEA1HKA2R2B | 50V 2.2U |
| C115, 116 | ECEA1EKA4R7B | 25V 4.7U |
| C117, 118 | ECEA0JKA470B | 6.3V 47U |
| C119, 120 | ECEA1HKAR22B | 50V 0.22U |
| C121-124 | ECQB1H392JF3 | 50V 3900P |
| C125, 126 | ECQB1H183JF3 | 50V 0.018U |
| C127, 128 | ECQB1H103JF3 | 50V 0.01U |
| C129, 130 | ECBT1H181KB5 | 50V 180P |
| C131 | RCE1AM471BV | 10V 470U |
| C132, 133 | ECBT1H470J5 | 50V 47P |
| C134 | ECEA1CKA100B | 16V 10U |
| C135 | ECEA0JKA101B | 6.3V 100U |
| C136 | ECQB1H393JF3 | 50V 0.039U |
| C137, 138 | ECEA1EKA4R7B | 25V 4.7U |
| C139, 140 | ECBT1H561KB5 | 50V 560P |
| C141, 142 | ECKR2H121KB5 | 500V 120P |
| C145, 146 | ECQB1H821JF3 | 50V 820P |
| C147, 148 | ECBT1E103ZF | 25V 0.01U |
| C149, 150 | ECBT1H102KB5 | 50V 1000P |
| C151, 152 | ECEA1EKA4R7B | 25V 4.7U |
| C153 | ECQB1H332JF3 | 50V 3300P |
| C155, 156 | ECBT1C682KR5 | 16V 6800P |
| C157 | ECBT1H102KB5 | 50V 1000P |
| C160 | ECEA1AKA221B | 10V 220U |
| C201 | ECQB1H472JF3 | 50V 4700P |
| C202 | ECEA1HKA3R3B | 50V 3.3U |
| C203 | ECBT1H470J5 | 50V 47P |
| C204, 205 | ECBT1E103ZF | 25V 0.01U |
| C206 | ECEA1HKA2R2B | 50V 2.2U |
| C301 | ECQP1103JZ3 | 100V 0.01U |
| C341 | ECFR1E183KR | 25V 0.018U |
| C342-344 | ECKD1H682KB | 50V 6800P |
| C345 | ECBT1E103ZF | 25V 0.01U |
| C346 | ECEA1EKA220B | 25V 22U |
| C348 | ECEA1HKA010B | 50V 1U |
| C349, 350 | ECBT1H221KB5 | 50V 220P |
| C351 | ECEA1EKA4R7B | 25V 4.7U |
| C352 | ECBT1E103ZF | 25V 0.01U |
| C356, 357 | ECKR1H392KB5 | 50V 3900P |
| C358 | ECQP1681JZ3 | 16V 680P |
| C359 | ECEA1EKA4R7B | 25V 4.7U |
| C360, 361 | ECKR1H392KB5 | 50V 3900P |
| C371 | ECBT1E103ZF | 25V 0.01U |
| C401, 402 | ECBT1H391KB5 | 50V 390P |
| C403, 404 | ECBT1C332KR5 | 16V 3300P |
| C407, 408 | ECQV1H124JM3 | 50V 0.12U |
| C409, 410 | ECBT1H102KB5 | 50V 1000P |
| C411, 412 | ECEA1HKAR47B | 50V 0.47U |
| C415, 416 | RCE1AM471BV | 10V 470U |
| C417, 418 | ECQB1H222JF3 | 50V 2200P |
| C419, 420 | ECEA1CKA100B | 16V 10U |
| C423, 424 | ECEA1HKA010B | 50V 1U |
| C425, 426 | ECQB1H152JF3 | 50V 1500P |
| C427, 428 | ECEA1HKAR47B | 50V 0.47U |
| C431, 432 | ECEA1EKA4R7B | 25V 4.7U |
| C435, 436 | ECEA1EKA4R7B | 25V 4.7U |
| C437 | ECEA1HKA100B | 50V 10U |
| C601, 602 | ECFR1H104ZF | 50V 0.1U |
| C603 | ECEA1EU222B | 25V 2200U ⚠ |
| C604, 605 | ECA1EM102B | 25V 1000U ⚠ |
| C606 | ECBT1E103ZF | 25V 0.01U |
| C607 | ECEA1AKA101B | 10V 100U |
| C608 | ECEA1AKA221B | 10V 220U |
| C609, 610 | ECBT1E103ZF | 25V 0.01U |
| C611 | ECEA1HKA010B | 50V 1U |
| C612 | ECKR2H682PE | 500V 6800P |
| C613 | ECEA1AU470 | 10V 47U |
| C614, 615 | ECBT1E103ZF | 25V 0.01U |
| C701, 702 | ECBT1E103ZF | 25V 0.01U |
| C703 | ECEA0JU102 | 6.3V 1000U |
| C704, 705 | ECBT1E103ZF | 25V 0.01U |
| C706 | ECEA1HKAR33B | 50V 0.33U |
| C707 | ECEA1HKAR22B | 50V 0.22U |
| C731 | ECBT1E103ZF | 25V 0.01U |
| C777 | ECEA1HKA3R3B | 50V 3.3U |
| C801, 802 | ECBT1E223ZF | 25V 0.022U |
| C805, 806 | ECBT1H104ZF5 | 50V 0.1U |
| C807 | ECEA1VKA470B | 35V 47U |
| C808 | ECEA1AKA101B | 10V 100U |
| C811, 812 | ECBT1H101KB5 | 50V 100P |
| C813, 814 | ECBT1H104ZF5 | 50V 0.1U |
| C815-818 | ECBT1H101KB5 | 50V 100P |
| C821 | ECEA0JKA221B | 6.3V 220U |
| C901 | ECBT1H470J5 | 50V 47P |
| C902 | ECBT1H104ZF5 | 50V 0.1U |
| C903 | ECBT1H470J5 | 50V 47P |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | CABINET PARTS | |
| | | | |
| 1 | RKM0265-K | CABINET | |
| 2 | RGP0409-K | FRONT PANEL | |
| 3 | RFKJSCH404EK | BOTTOM BOARD ASS'Y | |
| 3-1 | RKA0011-3 | FOOT | |
| 4 | RGR0198A-A | REAR PANEL | |
| 5 | RYF0287A-K | CASSETTE LID ASS'Y(DECK1) | |
| 5-1 | RGU0958B-K | BUTTON(CLOSE) | |
| 5-2 | RMM0122 | LOD | |
| 6 | RYF0288-K | CASSETTE LID ASS'Y(DECK2) | |
| 6-1 | RGU0958B-K | BUTTON(CLOSE) | |
| 6-2 | RMM0122 | LOD | |
| 7 | REZ0702 | FPC(15P) | |
| 8 | REZ0723 | CABLE ASS'Y(10P) | |
| 9 | RGL0243-Q | LEADING LIGHT PANEL(R.PLAY) | |
| 10 | RGL0244-Q | LEADING LIGHT PANEL(F.PLAY) | |
| 11 | RGL0245-Q | LEADING LIGHT PANEL(A) | |
| 12 | RGL0246-Q | LEADING LIGHT PANEL(B) | |
| 13 | RGU1094-K | MAIN BUTTON | |
| 14 | RGU1095-K | TPS BUTTON | |
| 15 | RMA0792 | ANGLE | |
| 16 | SHE185-2 | P.C.B.SPACER | |
| 20 | RHD30007 | SCREW | |
| 21 | XTBS3+8JFZ1 | SCREW | |
| 22 | XTBS26+8J | SCREW | |
| 23 | XTB3+10JFZ | SCREW | |
| 24 | XTW2+6S | SCREW | |
| 25 | XTB3+16JFZ | SCREW | |
| | | | |
| | | MECHANISM PARTS | |
| | | DECK1(PLAYBACK) | |
| | | | |
| 101 | RXF0045 | FLY WHEEL(F) ASS'Y | |
| 101-1 | RMQ0420 | WASHER | |
| 102 | RXF0046 | FLY WHEEL(R) ASS'Y | |
| 102-1 | RMQ0421 | WASHER | |
| 103 | RML0272 | SWITCH LEVER | |
| 104 | RXQ0265 | HEAD BASE ASS'Y | |
| 104-1 | RMB0266 | SPRING | |
| 104-2 | RXM0036 | ROD | |
| 105 | RGK0582-K | ORNAMENT PLATE | |
| 106 | RXQ0317-1 | HEAD ASS'Y(P.B) | |
| 106-1 | RHD17015 | AZIMUTH ADJUSTMENT SCREW | |
| 106-2 | RMB0352 | SPRING | |
| 106-3 | RMQ0360A | CONNECTOR HOLDER | |
| 107 | RDV108ZA | BELT | |
| 108 | RDK0019A | MAIN GEAR | |
| 109 | RMB0261 | SPRING | |
| 110 | RMB0262 | SPRING | |
| 111 | RMB0263 | SPRING | |
| 112 | RMB0264 | SPRING | |
| 113 | RUW147ZA | SPRING | |
| 114 | RML0267A | LEVER | |
| 115 | RML0268A | LEVER | |
| 116 | RMM0091A | BRAKE ROD | |
| 117 | RMS0398-1 | PLUNGER | |
| 118 | RSJ0003 | SOLENOID | |
| 119 | RUS609ZC | SPRING | |
| 120 | RXG0036 | REEL TABLE GEAR | |
| 121 | RXL0106 | IDLER LEVER | |
| 122 | RXP0052 | PINCH ROLLER(F)ASS'Y | |
| 122-1 | RMB0259 | SPRING | |
| 123 | RXP0053 | PINCH ROLLER(R)ASS'Y | |
| 123-1 | RMB0260 | SPRING | |
| 124 | RDG0206A-1 | GEAR | |
| 125 | RDG0209A | GEAR | |
| 126 | REM0036-1 | CAPSTAN MOTOR | |
| 127 | REM0043 | REEL MOTOR | |
| 128 | RHD26013 | SCREW | |
| 129 | RMC0169 | SPRING | |
| 130 | RMQ0314A | SPACER | |
| 131 | RXG0037 | GEAR ASS'Y | |
| 134 | RMB0269 | SPRING | |
| 135 | RML0270A-1 | LEVER | |
| 136 | RMQ0312A | DRIVE GEAR | |
| 137 | RMB0268 | SPRING | |
| 138 | RML0271A | LEVER | |
| 139 | XTW2+6S | SCREW | |
| 140 | RXR0018 | REEL TABLE | |
| 141 | XTW2+5L | SCREW | |
| 142 | XTW26+12S | SCREW | |
| 143 | XTW26+6L | SCREW | |
| 145 | RFKJSCH404AK | SUB CHASSIS ASS'Y | |
| 146 | RFKJSCH404BK | CHASSIS ASS'Y | |
| 149 | RYF0263-K1 | CASSETTE HOLDER ASS'Y | |
| 149-1 | RUS757ZA | SPRING | |
| 150 | RMQ0430 | NYLON RIVET | |
| 151 | RSC0395 | PLATE | |
| 152 | XTV26+4FFZ | SCREW | |
| 153 | RMB0388 | SPRING | |
| 154 | XWG2 | WASHER | |
| 155 | XTN2+6J | SCREW | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | MECHANISM PARTS | |
| | | DECK2(REC./PLAYBACK) | |
| | | | |
| 201 | RXF0045 | FLY WHEEL(F) ASS'Y | |
| 201-1 | RMQ0420 | WASHER | |
| 202 | RXF0046 | FLY WHEEL(R) ASS'Y | |
| 202-1 | RMQ0421 | WASHER | |
| 203 | RML0272 | SWITCH LEVER | |
| 204 | RXQ0265 | HEAD BASE ASS'Y | |
| 204-1 | RMB0266-1 | SPRING | |
| 204-2 | RXM0036 | ROD | |
| 205 | RGK0582-K | ORNAMENT PLATE | |
| 206 | RXQ0316-1 | HEAD ASS'Y(R/P) | |
| 206-1 | RHD17015 | AZIMUTH ADJUSTMENT SCREW | |
| 206-2 | RMB0352 | SPRING | |
| 206-3 | RMQ0360A | CONNECTOR HOLDER | |
| 207 | RDV108ZA | BELT | |
| 208 | RDK0019A | MAIN GEAR | |
| 209 | RMB0261 | SPRING | |
| 210 | RMB0262 | SPRING | |
| 211 | RMB0263 | SPRING | |
| 212 | RMB0264 | SPRING | |
| 213 | RUW147ZA | SPRING | |
| 214 | RML0267A | LEVER | |
| 215 | RML0268A | LEVER | |
| 216 | RMM0091A | BRAKE ROD | |
| 217 | RMS0398-1 | PLUNGER | |
| 218 | RSJ0003 | SOLENOID | |
| 219 | RUS609ZC | SPRING | |
| 220 | RXG0036 | REEL TABLE GEAR | |
| 221 | RXL0106 | IDLER LEVER | |
| 222 | RXP0052 | PINCH ROLLER(F)ASS'Y | |
| 222-1 | RMB0259 | SPRING | |
| 223 | RXP0053 | PINCH ROLLER(R)ASS'Y | |
| 223-1 | RMB0260 | SPRING | |
| 224 | RDG0206A-1 | GEAR | |
| 225 | RDG0209A | GEAR | |
| 226 | REM0036-1 | CAPSTAN MOTOR | |
| 227 | REM0043 | REEL MOTOR | |
| 228 | RHD26013 | SCREW | |
| 229 | RMC0169 | SPRING | |
| 230 | RMQ0314A | SPACER | |
| 231 | RXG0037 | GEAR ASS'Y | |
| 234 | RMB0269 | SPRING | |
| 235 | RML0270A-1 | LEVER | |
| 236 | RMQ0312A | DRIVE GEAR | |
| 237 | RMB0268 | SPRING | |
| 238 | RML0271A | LEVER | |
| 239 | XTW2+6S | SCREW | |
| 240 | RXR0018 | REEL TABLE | |
| 241 | XTW2+5L | SCREW | |
| 242 | XTW26+12S | SCREW | |
| 243 | XTW26+6L | SCREW | |
| 245 | RFKJSCH404AK | SUB CHASSIS ASS'Y | |
| 246 | RFKJSCH404BK | CHASSIS ASS'Y | |
| 249 | RYF0263-K1 | CASSETTE HOLDER ASS'Y | |
| 249-1 | RUS757ZA | SPRING | |
| 250 | RMQ0430 | NYLON RIVET | |
| 251 | RSC0395 | PLATE | |
| 252 | XTV26+4FFZ | SCREW | |
| 253 | RMB0388 | SPRING | |
| 254 | XWG2 | WASHER | |
| 255 | XTN2+6J | SCREW | |

# ■ Cabinet Parts Location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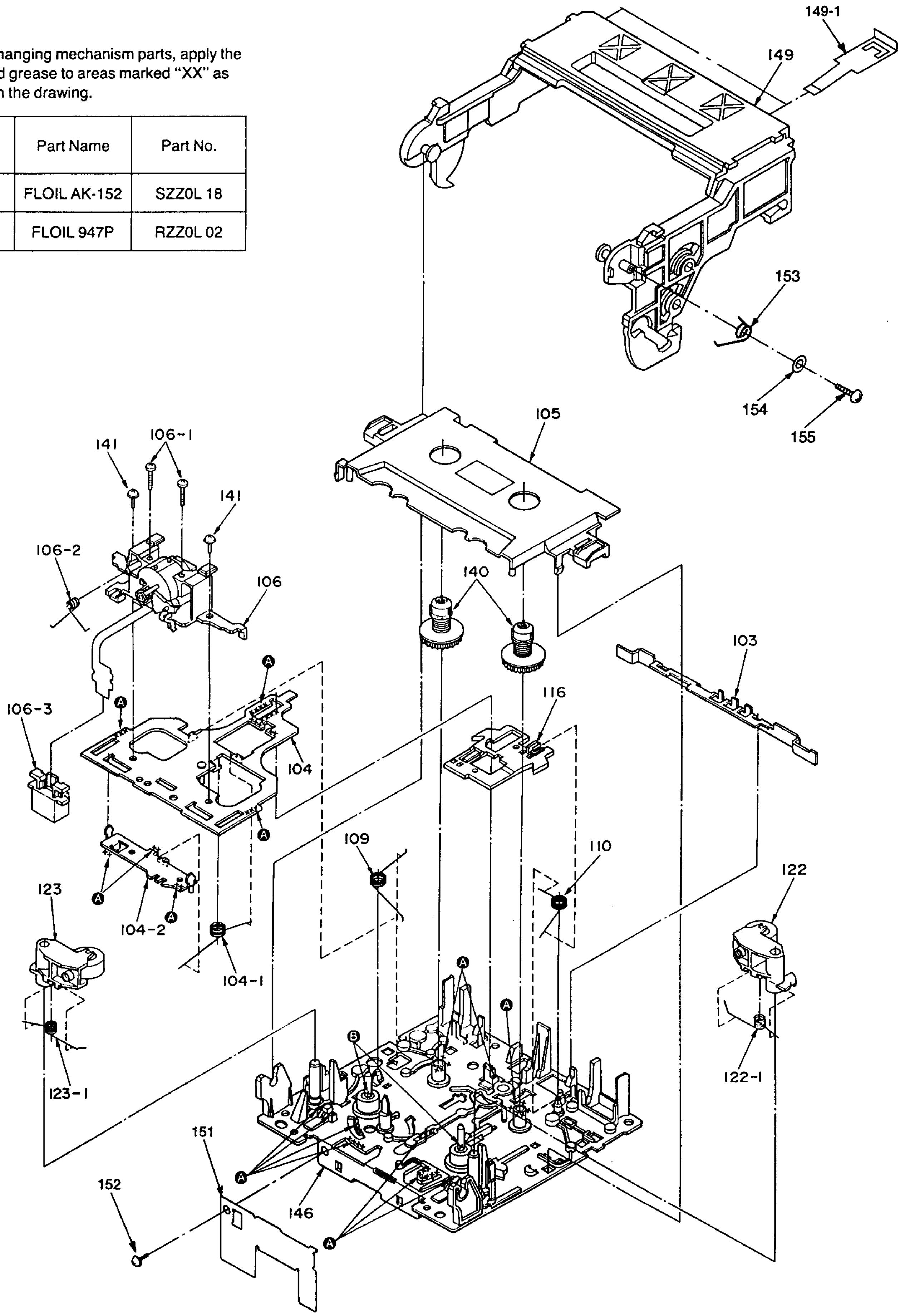
## ■ Mechanism Parts Location ● DECK 1 (PLAYBACK)

**Note:**
When changing mechanism parts, apply the specified grease to areas marked "XX" as shown in the drawing.

| Ref. No. | Part Name | Part No. |
|---|---|---|
| Ⓐ | FLOIL AK-152 | SZZ0L 18 |
| Ⓑ | FLOIL 947P | RZZ0L 02 |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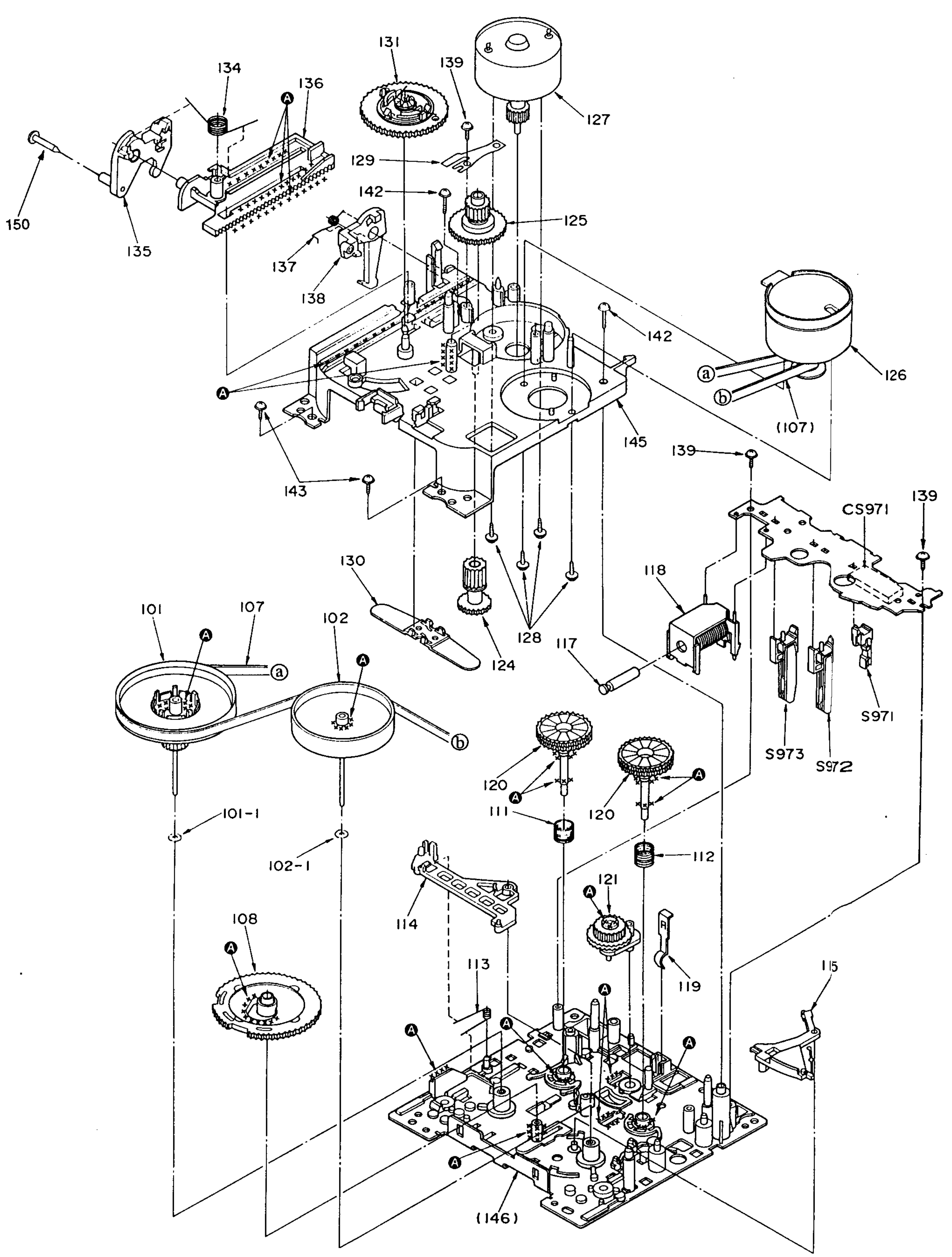
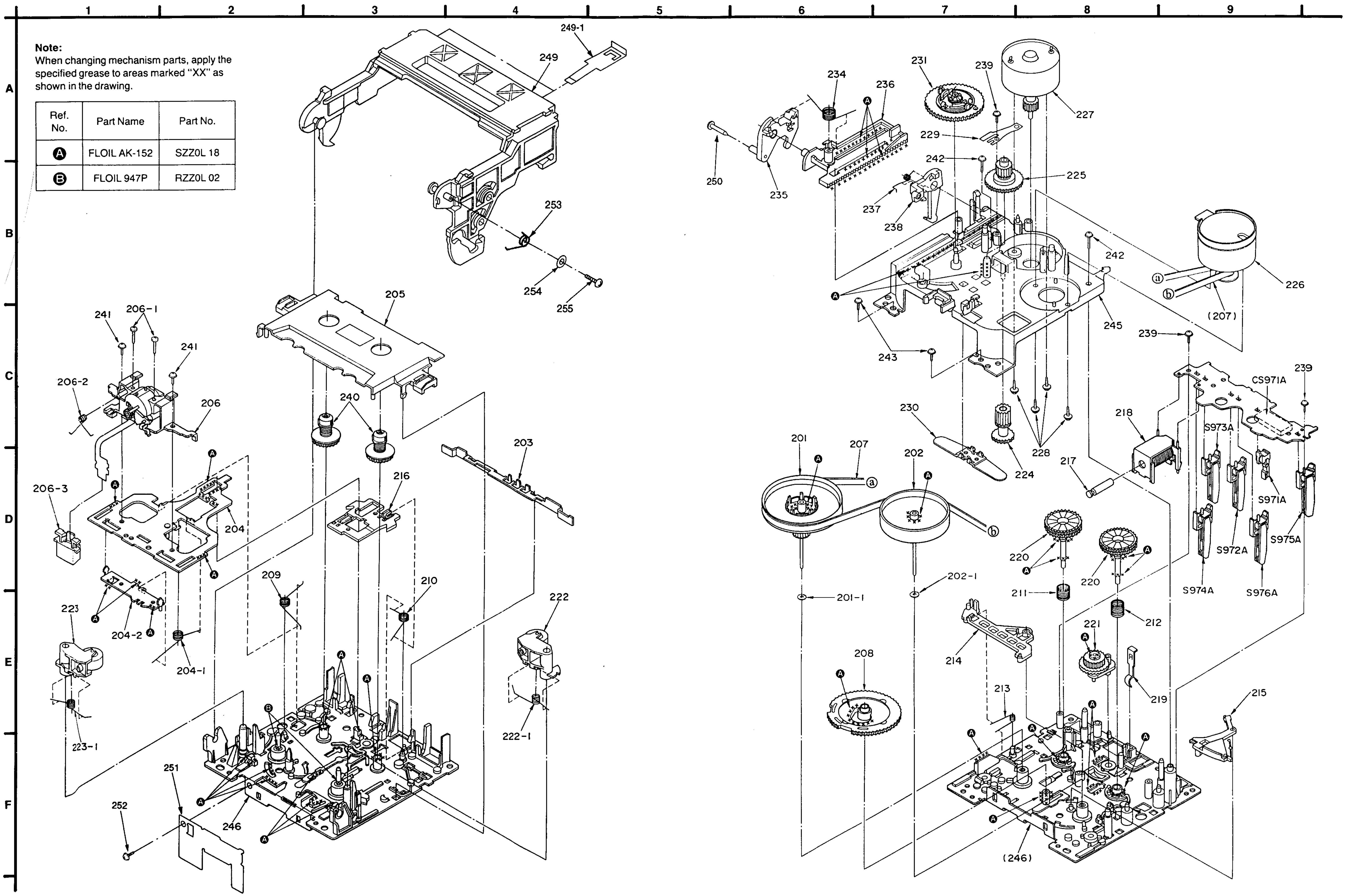
105
141
106-1
141
106-2
106
140
103
116
106-3
104
Ⓐ
109
110
122
123
104-2
104-1
122-1
123-1
Ⓑ
151
152
146


6
7
8
9
134
136
Ⓐ
131
139
127
150
135
129
142
125
137
138
153
142
126
ⓐ
ⓑ
(107)
145
139
143
CS971
139
130
118
101
107
102
128
117
124
S971
S973
S972
120
120
111
101-1
102-1
112
121
108
114
113
119
115
(146)

## ■ Mechanism Parts Location ● DECK 2 (RECORD/PLAYBACK)

**Note:**
When changing mechanism parts, apply the specified grease to areas marked "XX" as shown in the drawing.

| Ref. No. | Part Name | Part No. |
|---|---|---|
| Ⓐ | FLOIL AK-152 | SZZ0L 18 |
| Ⓑ | FLOIL 947P | RZZ0L 02 |


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
249-1
249
253
254
255
205
241
206-1
241
206-2
206
240
203
216
206-3
204
Ⓐ
209
210
222
223
204-2
204-1
222-1
223-1
Ⓑ
251
252
246
234
236
231
239
227
250
235
229
242
225
237
238
242
226
ⓐ
ⓑ
(207)
245
239
243
239
CS971A
230
201
207
202
218
228
224
217
S973A
S971A
S975A
S972A
S974A
S976A
220
220
211
212
201-1
202-1
221
214
208
213
219
215
(246)

ORDER NO. PAAU 940649C6

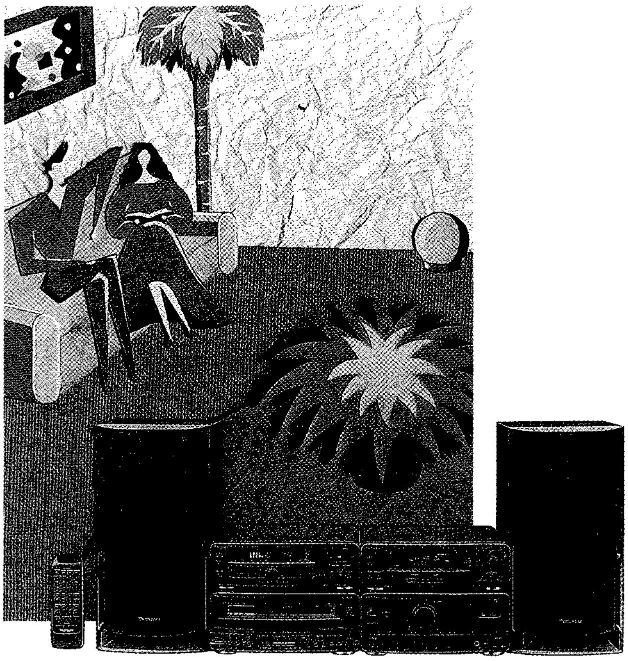
# Service Manual

## Hi-Fi Speaker System

## Speaker System
# SB-CH510A

**Colour**

(K)......Black Type



## SPECIFICATIONS

| | |
|---|---|
| **Type** | 3-way 3-speaker system |
| **Speakers** | Woofer: 14 cm cone type<br>Midrange: 6 cm cone type<br>Tweeter: piezo type |
| **Impedance** | 6 Ω |
| **Input Power** | 70W, Music<br>35W, DIN |
| **Output Sound Pressure Level** | 84 dB/W (1,0 m) |
| **Crossover Frequency** | 3,3 kHz, 10 kHz |
| **Frequency Range** | 42 Hz ≈ 22 kHz (-16 dB)<br>49 Hz ≈ 20 kHz (-10 dB) |
| **Dimensions (W x H x D)** | 210 x 414 x 244 mm |
| **Weight** | 4,3 kg |

**Note:**
Design and specifications are subject to change without notice.

## ESPECIFICACIONES

| | |
|---|---|
| **Tipo** | Sistema con 3 altavoces |
| **Altavoces** | Graves: tipo cónico de 14 cm<br>Medios: tipo cónico de 6 cm<br>Agudos: tipo cerámico |
| **Impedancia** | 6 Ω |
| **Capacidad de potencia** | 70W, Música<br>35W, DIN |
| **Nivel de presión acústica de salida** | 84 dB/W (1,0 m) |
| **Frecuencia de cruce** | 3,3 kHz, 10 kHz |
| **Respuesta de frecuencias** | 42 Hz ≈ 22 kHz (-16 dB)<br>49 Hz ≈ 20 kHz (-10 dB) |
| **Dimensiones (W x H x D)** | 210 x 414 x 244 mm |
| **Peso** | 4,3 kg |

**Nota:**
Estas especificaciones están sujetas a cualquier cambio sin previo aviso.

## SPECIFICATIONS

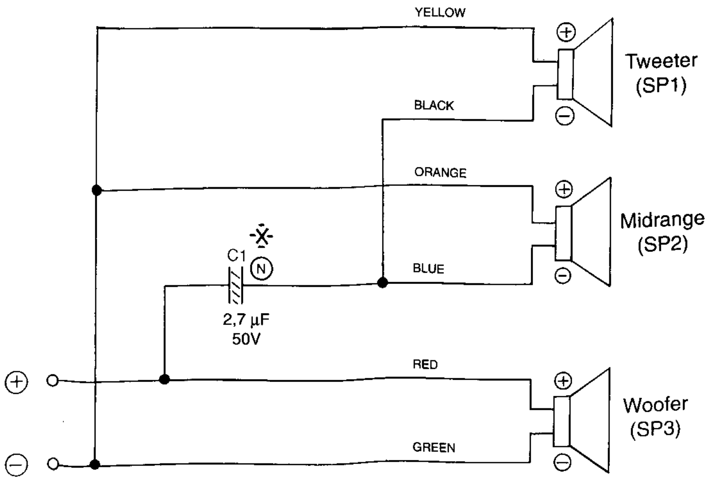
| | |
|---|---|
| **Type** | 3-voies 3-haut-parleurs |
| **Haut-parleurs** | Graves: 14 cm type a cone<br>Moyennes: 6 cm type a cone<br>Aigus: type ceramique |
| **Impédance** | 6 Ω |
| **Entrée maximale** | 70W, Musique<br>35W, DIN |
| **Niveau de pression sonore de sortie** | 84 dB/W (1,0 m) |
| **Fréquence de conmutation** | 3,3 kHz, 10 kHz |
| **Gamme de fréquences** | 42 Hz ≈ 22 kHz (-16 dB)<br>49 Hz ≈ 20 kHz (-10 dB) |
| **Dimensions (W x H x D)** | 210 x 414 x 244 mm |
| **Poids** | 4,3 kg |

**Note:**
Suject à changement sans preavis.

## SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)
(Este esquema puede ser modificado en cualquier momento con el desarrollo de nuevas tecnologías.)

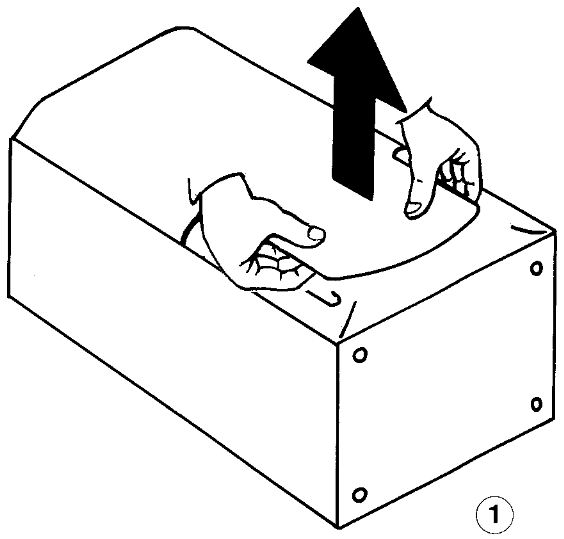
Ⓝ NON-POLAR CAPACITOR

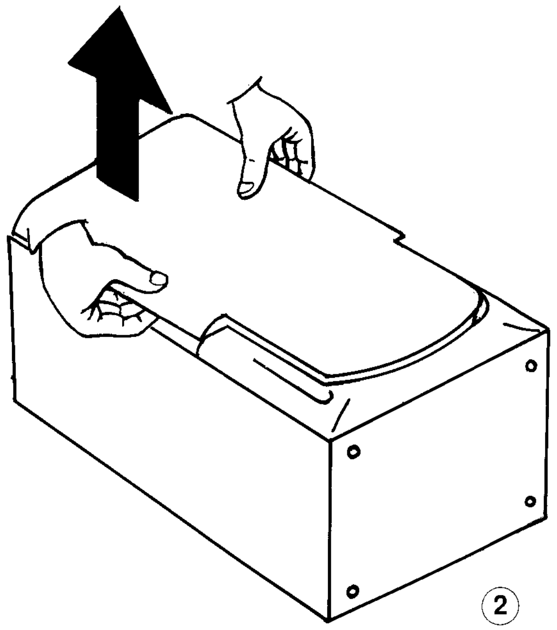


**Technics**

## DISASSEMBLY INSTRUCTIONS

| Ref. No. 1 | Removal of the Speaker Net |
|---|---|
| Procedure 1 | |

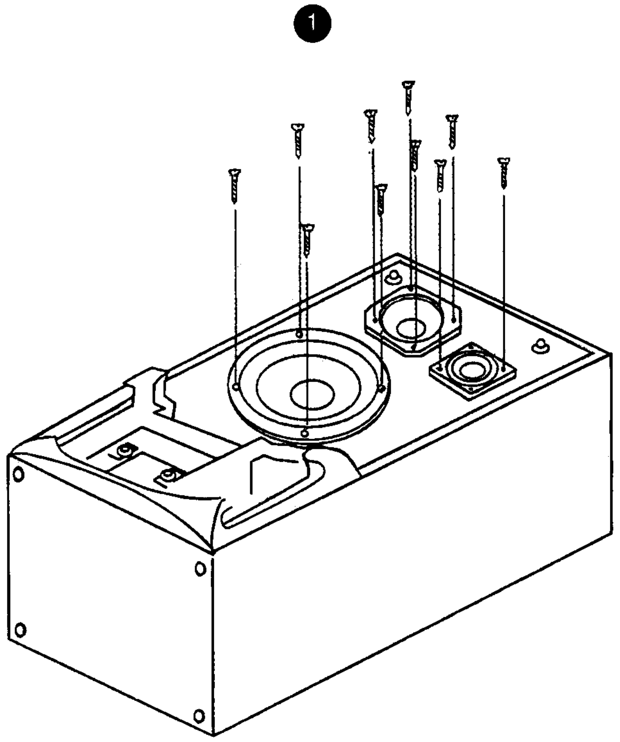




1 - Put the Speaker System upside down carefully for scratches.

2 - Lift up the Net Frame using the finger as it is show in the picture ① and ②.

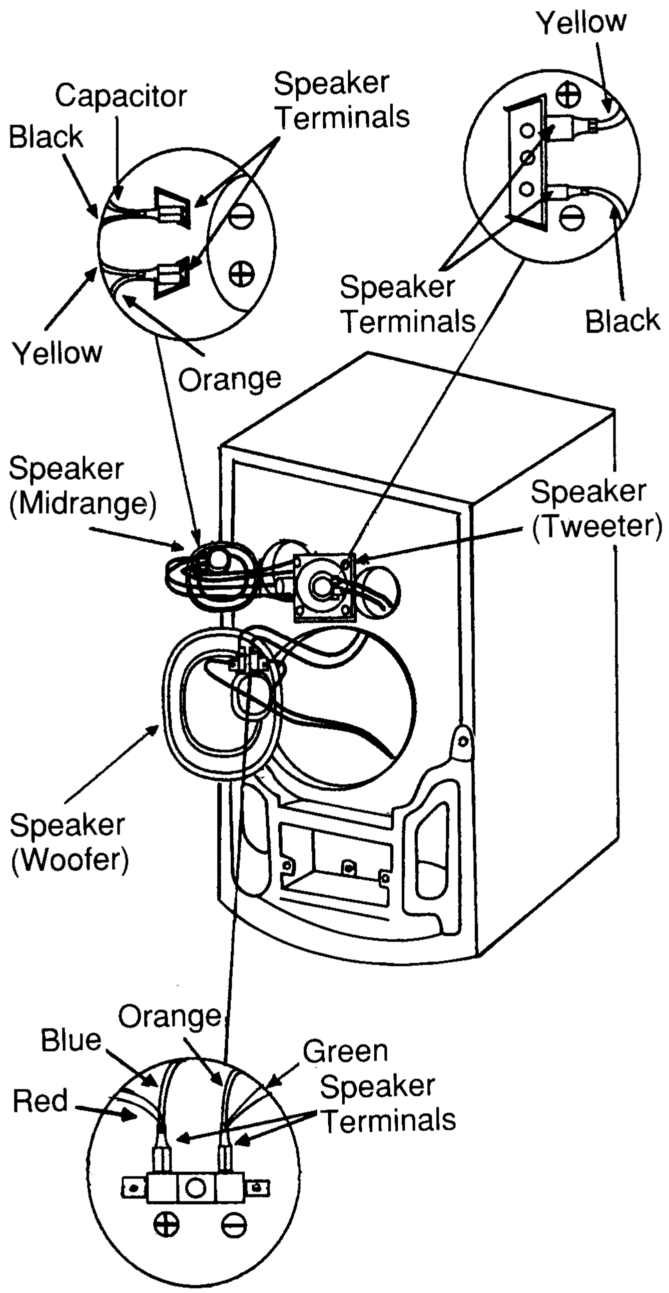
| Ref. No. 2 | Removal of the Speakers |
|---|---|
| Procedure 1→2 | |



1 - Lay down the Speaker System on its back as shown.

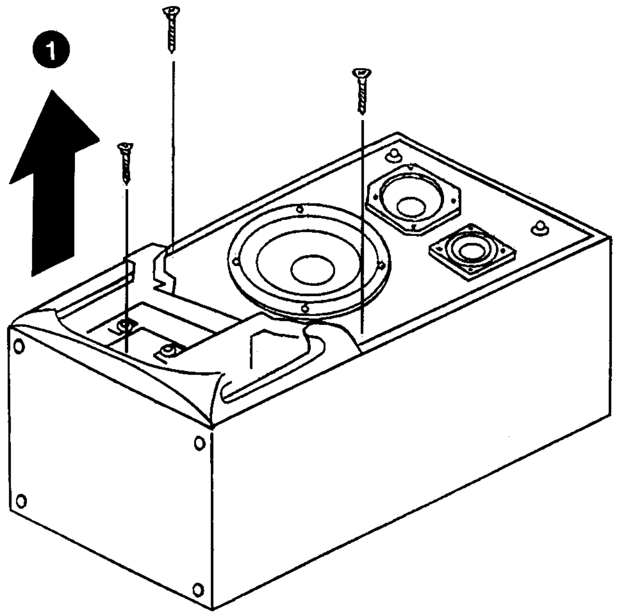
2 - Remove the 10 screws ❶

| Ref. No. 3 | Removal of the Speaker Terminal |
|---|---|
| Procedure 1→2→3 | |


Capacitor
Black
Speaker Terminals
Yellow
Yellow
Orange
Speaker Terminals
Black
Speaker (Midrange)
Speaker (Tweeter)
Speaker (Woofer)
Blue
Orange
Green
Red
Speaker Terminals

- Remove the 6 Speaker Terminals.

| Ref. No. 4 | Removal of the Front Panel |
|---|---|
| Procedure 1→4 | |

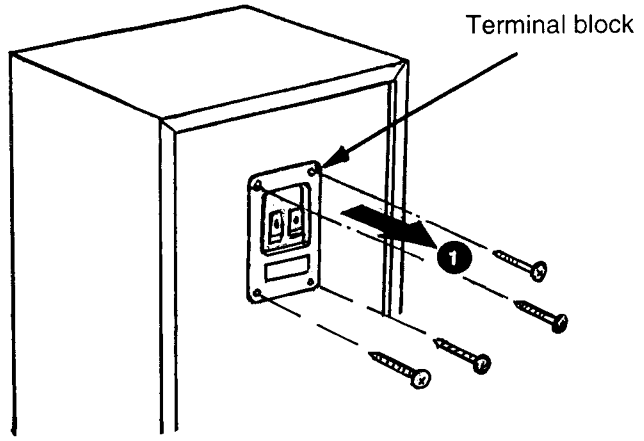


- Remove the 3 screws.
- Remove the Front Panel in the direction of the arrow ❶

### ATTENTION

When remove the Front Panel be carefull with the two Bass Port to prevent broken it.

| Ref. No. 5 | Removal of the Terminal Block |
|---|---|
| Procedure 5 | |


Terminal block
❶

- Remove the 4 screws.
- Remove the Terminal Block in the direction of the arrow ❶

## ■ REPLACEMENT PARTS LIST

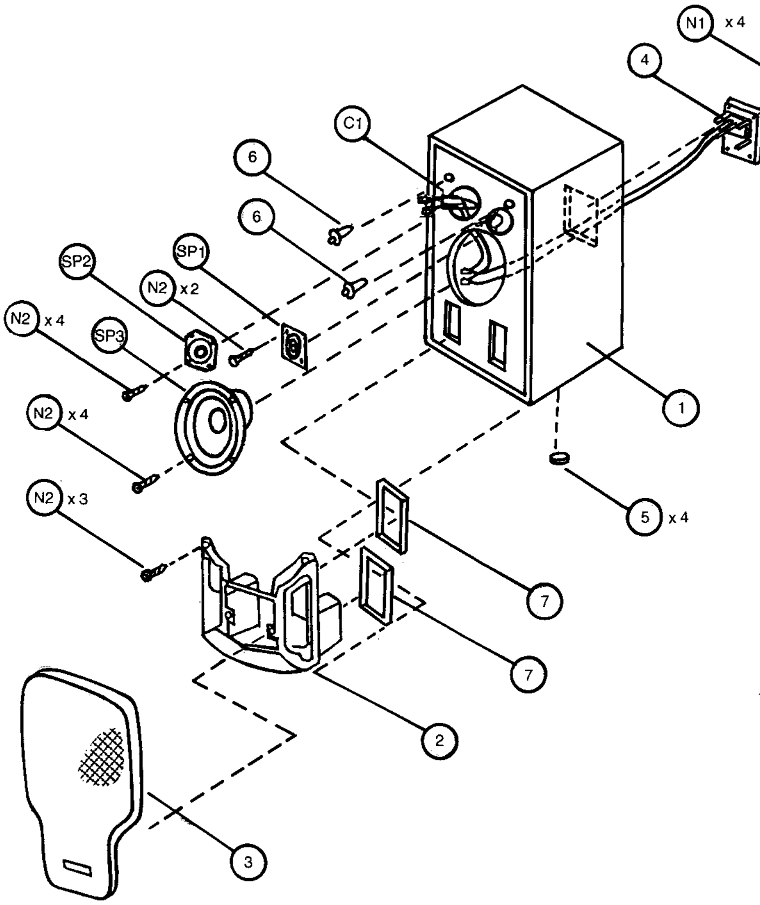
Notes 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. PAES indicates parts that are supplied by PAES.

Nota 1. El código está indicado en la mayoría de las piezas. Por favor, use este código para sus pedidos.
2. La indicación PAES significa recambios suministrados a través de PAES.

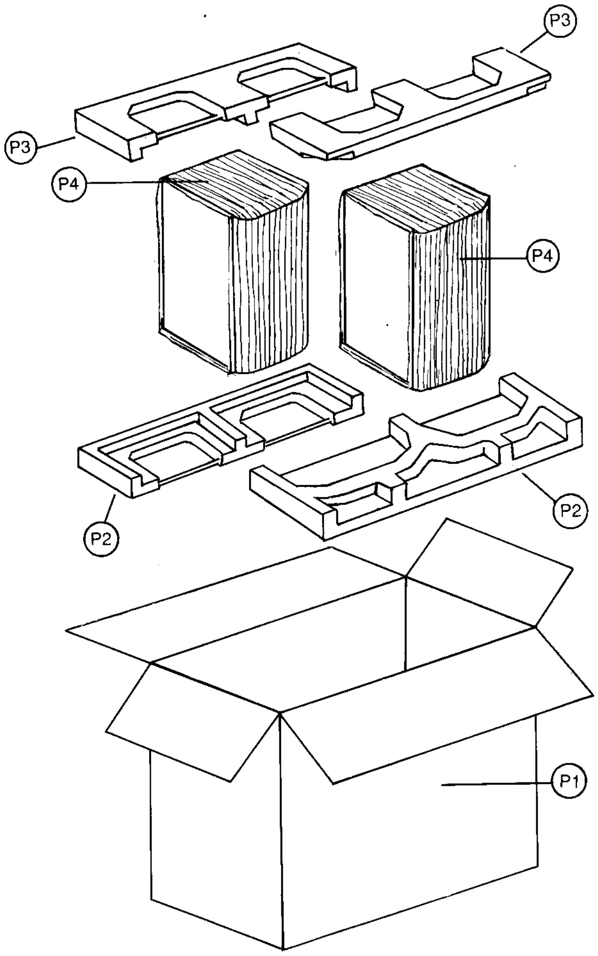
| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | SPEAKER (S) | |
| | | | |
| SP1 | EASJ3FP07B3 | SPEAKER (TWEETER) | PAES |
| SP2 | EAS6PH319A6 | SPEAKER (MIDRANGE) | PAES |
| SP3 | EAS14PL304C6 | SPEAKER (WOOFER) | PAES |
| | | | |
| | | CAPACITOR(S) | |
| | | | |
| C1 | REX8GCH510A | CAPACITOR ASS'Y | PAES |
| | | | |
| | | CABINET PARTS | |
| | | | |
| 1 | SYM8GCH510A | CABINET ASS'Y | PAES |
| 2 | RGP8GBCH510A | FRONT PANEL | PAES |
| 3 | SYB8GCH510A | GRILL | PAES |
| | | | |
| | | | |
| | | | |
| | | | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| 4 | SWE8GCH510A | TERMINAL ASS'Y | PAES |
| 5 | RKA8G0066-K | LEG | PAES |
| 6 | RKQ8G0025 | CATCH PIN | PAES |
| 7 | RMQ8G0469 | GASKET | PAES |
| | | | |
| | | SCREW (S) | |
| | | | |
| N1 | XTNS42+16FG | SCREW | PAES |
| N2 | XTNS42+20 | SCREW | PAES |
| | | | |
| | | PACKING PARTS | |
| | | | |
| P1 | SPG8GBCH510A | CARTON BOX | PAES |
| P2 | SPS8GCH510AB | PAD (DOWN) | PAES |
| P3 | SPS8GCH510CD | PAD (UP) | PAES |
| P4 | SPHS8G415 | SHEET | PAES |
| | | | |
| | | | |
| | | | |

## ■ EXPLODED VIEW



## ■ PACKAGING



PAES Printed in Spain
A940609000JS

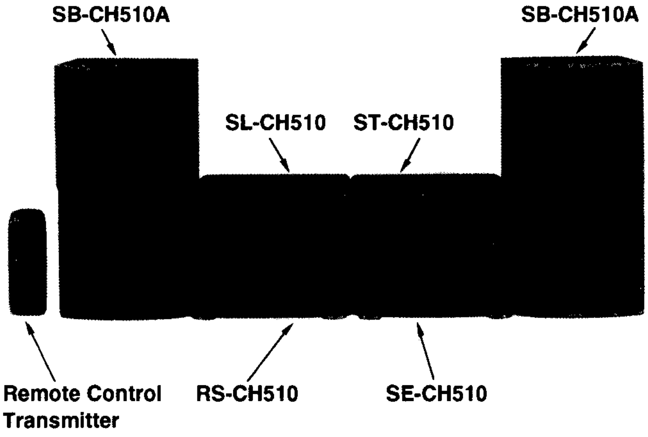
ORDER NO. AD9407196C8

# Service Manual

Tuner/Sound Processor

Tuner

# ST-CH510



**Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.**

**Colour**

(K) ................ Black Type

**Areas**

| Suffix for Model No. | Area | Colour |
|---|---|---|
| (E) | Europe | (K) |
| (EG) | Germany and Italy | |
| (GC) | Asia, Latin America, Middle Near East and Africa, Oceania | |

## Specifications

## System: SC-CH510

### ■ Pre-amplifier section

| | |
|---|---|
| **Input sensitivity/impedance** | |
| **For (E) and (EG) areas** | |
| **PHONO** | 2.5 mV/47 kΩ |
| **DCC** | 250 mV/15 kΩ |
| **For (GC) area** | |
| **AUX** | 250 mV/15 kΩ |
| **DCC** | 250 mV/15 kΩ |
| **Output level** | |
| **DCC RECOUT** | 150 mV/1.5 kΩ |
| **Frequency response** | |
| **For (E) and (EG) areas** | |
| **PHONO** | 30 Hz – 15 kHz/+1.5 to –2.0 dB |
| **DCC** | 30 Hz – 20 kHz |
| **For (GC) area** | |
| **AUX** | 30 Hz – 20 kHz |
| **DCC** | 30 Hz – 20 kHz |

### ■ EQ, SFP section

| | |
|---|---|
| **Center frequency** | 200 Hz, 1 kHz, 7 kHz |
| **Fixed mode** | |
| **5 modes** | HALL, HEAVY, CLEAR, CAR, HP ST |

### ■ FM tuner section

| | |
|---|---|
| **Frequency range** | 87.50 – 108.00 MHz<br>(0.05 MHz steps) |
| **Sensitivity** | 1.8 µV (IHF usable) |
| **S/N 26 dB** | 1.5 µV |
| **S/N** | MONO 70 dB (75 dB, IHF) |
| **Stereo separation 1 kHz** | 35 dB |
| **Antenna terminal(s)** | 75 Ω (unbalance) |

### ■ AM tuner section

| | |
|---|---|
| **Frequency range** | |
| **MW** | 522 – 1611 kHz (9 kHz steps)<br>530 – 1620 kHz (10 kHz steps) |
| **LW** | 144 – 288 kHz (9 kHz steps) |
| **Sensitivity (S/N 20 dB)** | |
| **MW** | 500 µV/m |
| **LW** | 50 µV |

### ■ Timer section

| | |
|---|---|
| **Clock** | Quarts-lock type |
| **Function** | 24-hour programmable;<br>Play timer (1 time), Rec timer (1 time),<br>Sleep (120 min., 1 min. intervals) |
| **Setting** | 1 minute – 23 hours 59 minutes (1 min. intervals) |

### ■ General

| | |
|---|---|
| **Dimensions (W × H × D)** | 270 × 89 × 274 mm |
| **Weight** | 1.75 kg |

**Notes:**

1. Specifications are subject to change without notice. Weight and dimensions are approximate.
2. Total harmonic distortion is measured by the digital spectrum analyzer.

| System | Tuner/sound processor | Compact disc player | Amplifier | Cassette Deck | Speakers |
|---|---|---|---|---|---|
| **SC-CH510** | **ST-CH510** | SL-CH510 | SE-CH510 | RS-CH510 | * SB-CH510A |

**Technics**®

*: For (E), (EG) areas ...... Made in PAES
For (GC) area ............. Made in NABEL

## ■ Contents

Page
- Location of Controls ........ 2
- Setting the Time ........ 2
- Operation Check and Main Component Replacement Procedures ........ 3, 4
- Schematic Diagram ........ 5~16
- Printed Circuit Board Diagram ........ 17~20

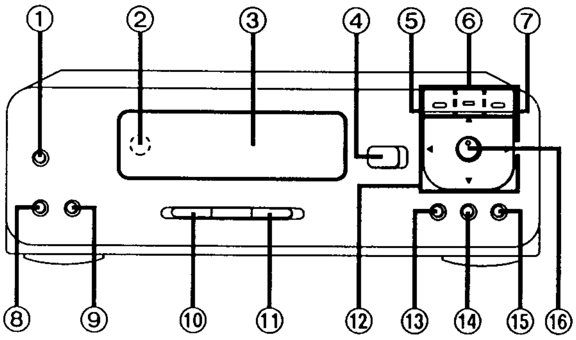
Page
- Wiring Connection Diagram ........ 20
- Block Diagram ........ 21~23
- Power Supply with Tuner ST-CH510 ........ 24
- Function of IC Terminals ........ 25
- Replacement Parts List ........ 26~30
- Cabinet Parts Location ........ 31

**NOTE:**
**Refer to the service manual for Model No. SE-CH510 (ORDER No. AD9407197C8) for information on “Accessories”, “Stacking the Components”, “Connections” and “Packaging”.**

**This unit (tuner/sound processor ST-CH510) is equipped with a self-diagnostic function.**
**For details of the self-diagnostic function, refer to the service manual (ORDER No. AD9407191C2) for SL-CH510 (CD player).**

## ■ Location of Controls

**① Auto preset button**
**② Remote control signal sensor**
**③ Display section**
**④ Source input select button**
**⑤ FM button**
**⑥ Tuner indicator**
**⑦ LW/MW select button**
**⑧ Flat button**
**⑨ EQ SPACE mode select button**
**⑩ KARAOKE mode select button**
**⑪ V.bass button**
**⑫ Tuning/select button and indicators**
**⑬ Clock/timer button**
**⑭ Record timer button**
**⑮ Play timer button**
**⑯ Set button and indicator**



**(To be continued)**

## ■ Setting the Time

This is a 24-hours display clock.
These instructions explain how to set the timer for 16:25 (4:25 p.m.) on Wednesday.

*1* **Switch on the power.**

*2* **① Press CLOCK/TIMER to show “CLOCK”.**
**Within 8 seconds**
**② Press SET.**

*3* **① Press ◁ SELECT or SELECT ▷ to select the day.**
**② Press SET.**

*4* **① Press ◁ SELECT or SELECT ▷ to select the hour.**
**② Press SET.**

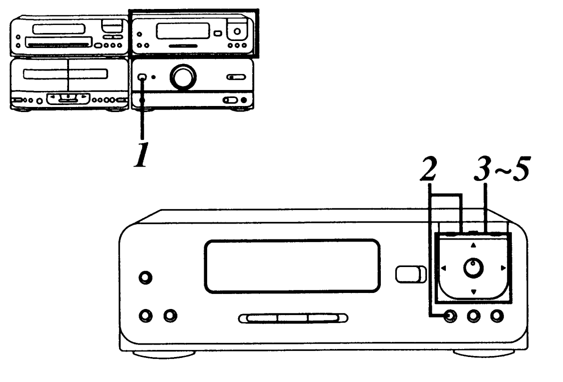
*5* **① Press ◁ SELECT or SELECT ▷ to select the minutes.**
**② Press SET to finish setting the time.**

The display will return to the previous display after about 2 seconds.

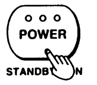
**When “SUN 0:00” flashes A**
It flashes when you connect the AC power supply cord for the first time or if there has been a power failure.
If this happens, reset the time.

**If the minutes setting has gone wrong:**
1. Press CLOCK/TIMER.
2. Press SET 3 times.
3. Press ◁ SELECT or SELECT ▷ to set the minutes, and then press SET.

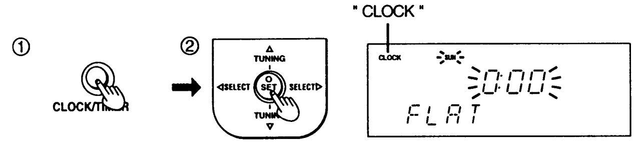
**To display the clock again:**
Press CLOCK/TIMER.
The clock display will appear for about 8 seconds.



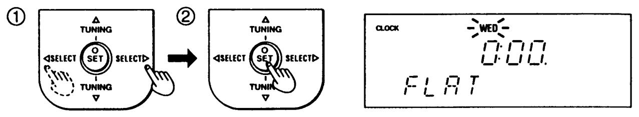
1


POWER
STANDBY/ON

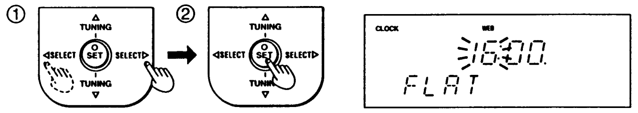
2


①
②
CLOCK/TIMER
TUNING
SELECT
SET
" CLOCK "
CLOCK
0:00
FLAT

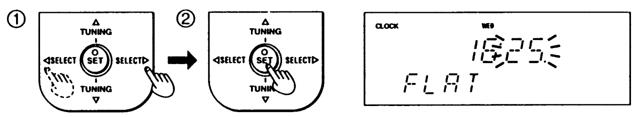
3


①
②
WED
0:00
FLAT

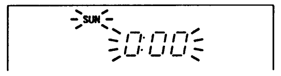
4


①
②
16:00
FLAT

5


①
②
18:25
FLAT

A

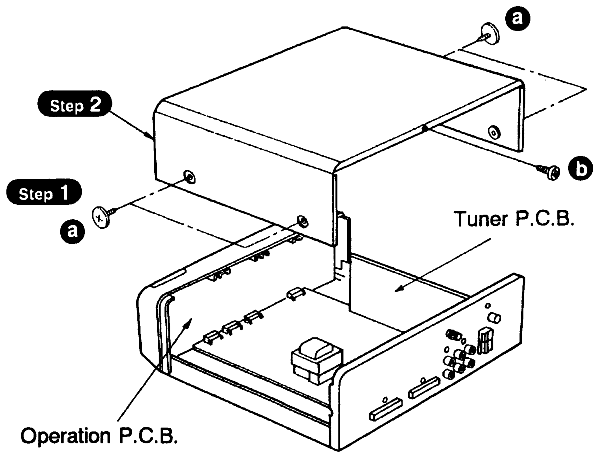


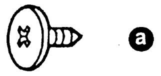
## ■ Operation Check and Main Component Replacement Procedures

**NOTE**

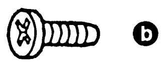
1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Illustrated screws are equivalent to actual size.**

### 1. Checking for the tuner P.C.B. and operation P.C.B.


Step 2
Step 1
a
a
b
Tuner P.C.B.
Operation P.C.B.

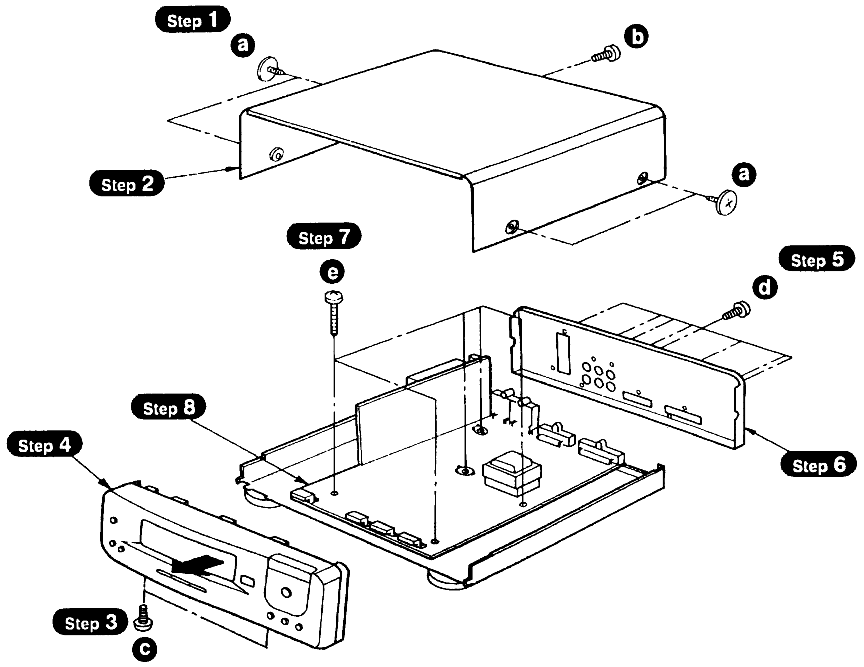


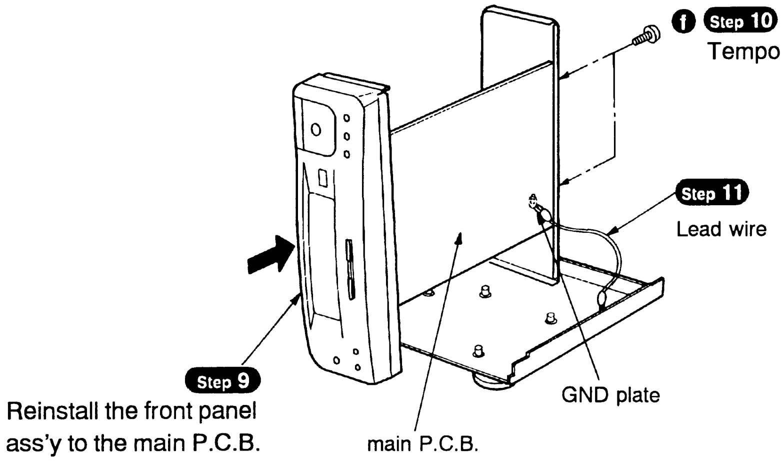
[RHD30007] (Black)



[XTBS3+8JFZ] (Black)

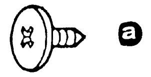
### 2. Checking for the main P.C.B.


Step 1
a
b
Step 2
a
Step 7
e
Step 5
d
Step 8
Step 4
Step 6
Step 3
c


f Step 10
Step 11
Lead wire
Step 9
GND plate
main P.C.B.

Temporarily secure with screw.

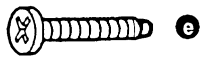
Reinstall the front panel ass'y to the main P.C.B.



[RHD30007] (Black)

[XTB3+8JFZ] (Black)

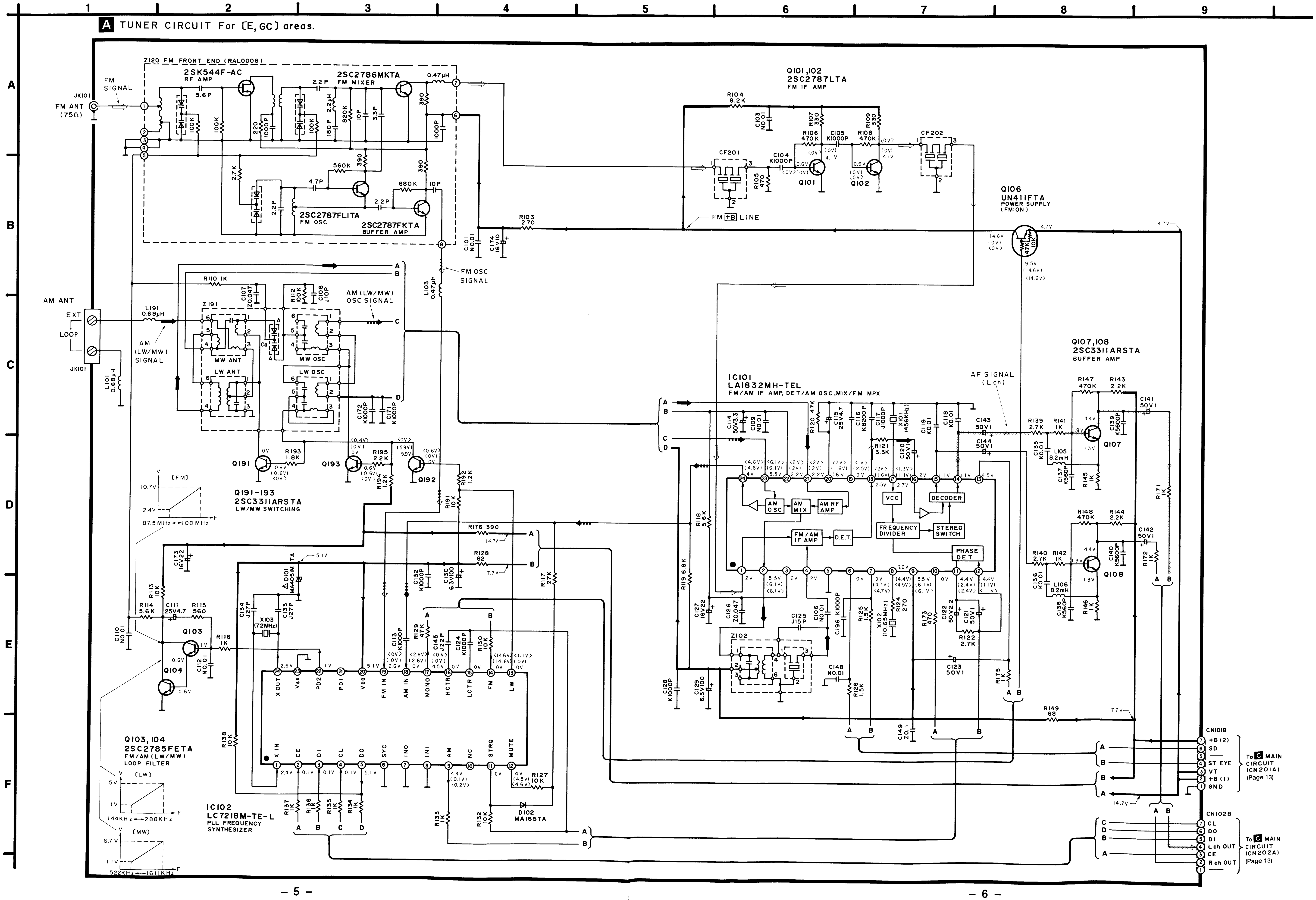
[XTBS3+8JFZ1] (Black)



[XTB3+16JFZ] (Black)

[XTBS3+8JFZ1] (Black)

## ■ Schematic Diagram • Tuner circuit for (E) and (GC) areas (Parts list on Page 26~30)


1
2
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6
7
8
9
A
B
C
D
E
F
A TUNER CIRCUIT For [E, GC] areas.
Z120 FM FRONT END (RAL0006)
2SK544F-AC RF AMP
2SC2786MKTA FM MIXER
2SC2787FLITA FM OSC
2SC2787FKTA BUFFER AMP
JK101 FM ANT (75Ω)
FM SIGNAL
FM OSC SIGNAL
Q101,102 2SC2787LTA FM IF AMP
CF201
CF202
FM +B LINE
Q106 UN411FTA POWER SUPPLY (FM·ON)
AM ANT
EXT
LOOP
JK101
AM (LW/MW) SIGNAL
AM (LW/MW) OSC SIGNAL
Z191
MW ANT
LW ANT
MW OSC
LW OSC
Q191–193 2SC3311ARSTA LW/MW SWITCHING
Q191
Q192
Q193
[FM]
10.7V
2.4V
87.5MHz↔108MHz
IC101 LA1832MH-TEL FM/AM IF AMP, DET/AM OSC, MIX/FM MPX
AM OSC
AM MIX
AM RF AMP
FM/AM IF AMP
D.E.T
VCO
DECODER
FREQUENCY DIVIDER
STEREO SWITCH
PHASE D.E.T.
Z102
AF SIGNAL (L ch)
Q107,108 2SC3311ARSTA BUFFER AMP
Q107
Q108
Q103,104 2SC2785FETA FM/AM (LW/MW) LOOP FILTER
Q103
Q104
[LW]
5V
1V
144KHz↔288KHz
[MW]
6.7V
1.1V
522KHz↔1611KHz
IC102 LC7218M-TE-L PLL FREQUENCY SYNTHESIZER
X103 (72MHz)
D101 MA4051M
D102 MA165TA
XOUT
Vss
PD2
PDI
VDD
FM IN
AM IN
MONO
HCTR
LCTR
FM
LW
X IN
CE
DI
CL
DO
SYC
INO
INI
AM
NC
STRO
MUTE
CN101B
+B (2)
SD
ST EYE
VT
+B (1)
GND
To C MAIN CIRCUIT (CN201A) (Page 13)
CN102B
CL
DO
DI
L ch OUT
CE
R ch OUT
To C MAIN CIRCUIT (CN202A) (Page 13)

- This schematic diagram may be modified at any time with the development of new technology.

**Notes:**

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
- Voltage values and waveforms are measured as indicated in the schematic diagram when test points between **TP901** and **TP902**, and between **TP903** and **TP904** are shorted.

  No mark : FM mode ( ) : AM (MW) mode < > : AM (LW) mode

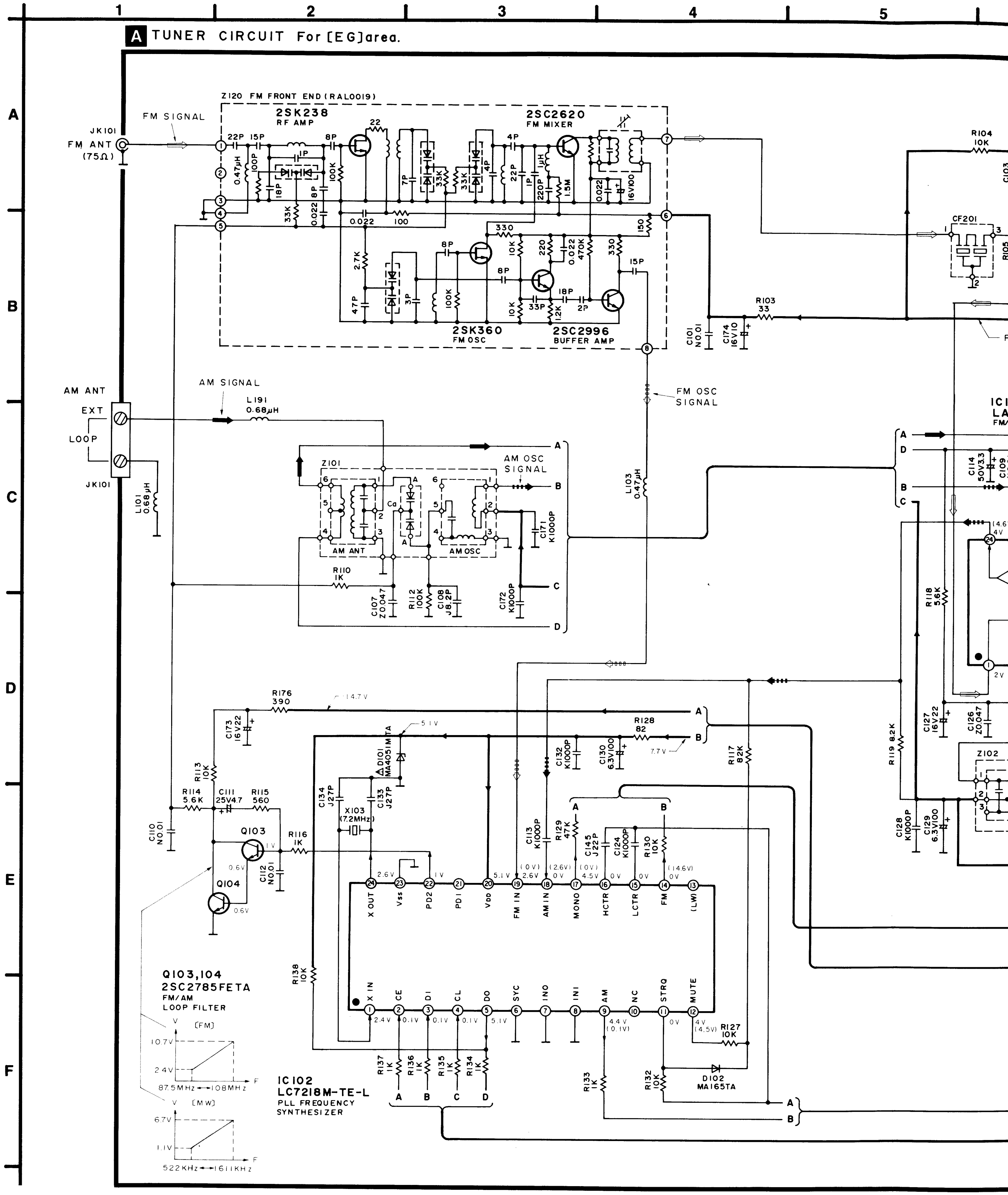
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

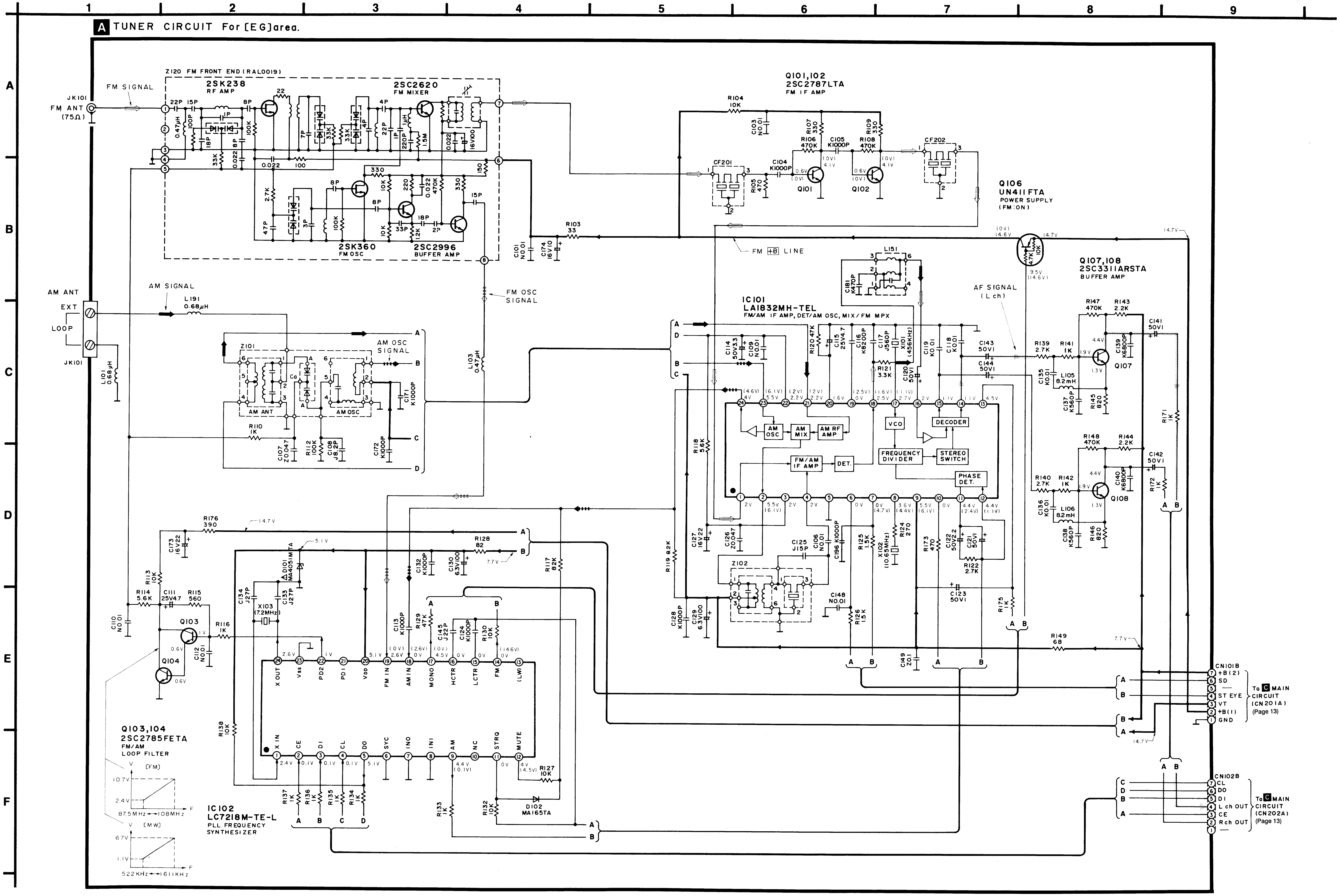
- **Voltage and signal line**

━━▶ : Positive voltage line
➡ : AM (LW/MW) signal line
■■■➡ : AM (LW/MW) OSC signal line
⇨ : FM signal line
□□□⇨ : FM OSC signal line
⇨ : AF signal (Lch) line

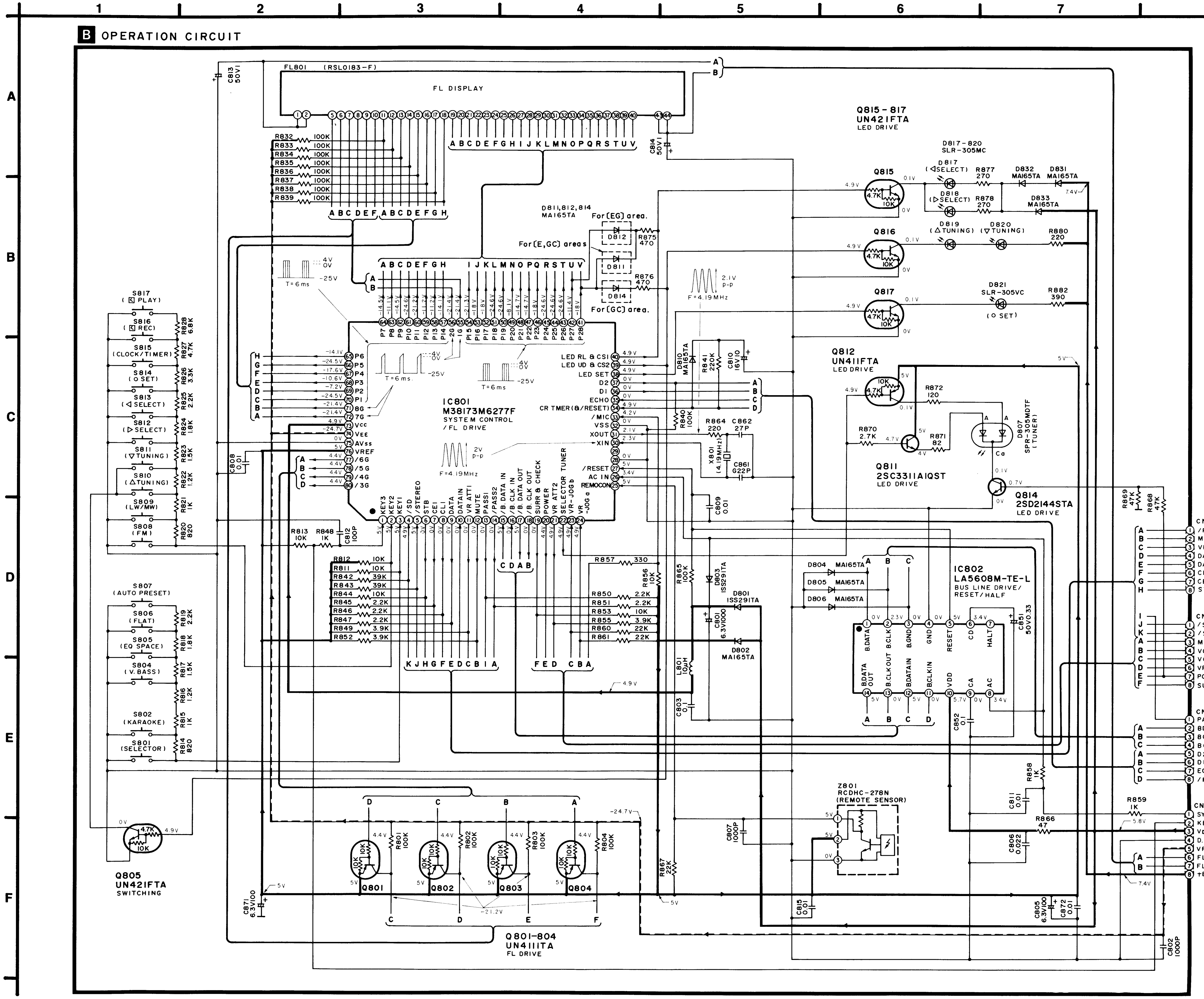
## ● Tuner circuit for (EG) area (Parts list on Page 26~30)


1
2
3
4
5
A
B
C
D
E
F
A TUNER CIRCUIT For [EG] area.
Z120 FM FRONT END (RAL0019)
FM SIGNAL
JK101
FM ANT
(75Ω)
2SK238
RF AMP
2SC2620
FM MIXER
2SK360
FM OSC
2SC2996
BUFFER AMP
AM ANT
EXT
LOOP
JK101
AM SIGNAL
L191
0.68µH
L101
0.68µH
Z101
AM ANT
AM OSC
AM OSC SIGNAL
FM OSC SIGNAL
L103
0.47µH
R110
1K
R112
100K
C107
C108
C171
C172
R103
33
R104
10K
CF201
C101
C174
R176
390
R128
82
C173
R113
10K
R114
5.6K
C111
R115
560
R116
1K
Q103
Q104
C110
C112
D101
MA4051MTA
X103
(7.2MHz)
C134
C133
C113
R129
47K
C145
C124
R130
10K
C132
C130
R117
82K
R119 82K
R118
5.6K
C127
C126
C128
C129
Z102
X OUT
Vss
PD2
PD1
VDD
FM IN
AM IN
MONO
HCTR
LCTR
FM
(LW)
X IN
CE
DI
CL
DO
SYC
INO
IN1
AM
NC
STRQ
MUTE
R138
10K
R137
1K
R136
1K
R135
1K
R134
1K
R133
1K
R132
10K
R127
10K
D102
MA165TA
Q103,104
2SC2785FETA
FM/AM
LOOP FILTER
V [FM]
10.7V
2.4V
87.5MHz←→108MHz
V [MW]
6.7V
1.1V
522KHz←→1611KHz
F
IC102
LC7218M-TE-L
PLL FREQUENCY
SYNTHESIZER

## ● Tuner circuit for (EG) area (Parts list on Page 26~30)


A TUNER CIRCUIT For [EG]area.
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
Z120 FM FRONT END (RAL0019)
2SK238
RF AMP
2SC2620
FM MIXER
2SK360
FM OSC
2SC2996
BUFFER AMP
JK101
FM ANT
(75Ω)
FM SIGNAL
AM ANT
EXT
LOOP
AM SIGNAL
L191
0.68μH
L101
0.68μH
Z101
AM ANT
AM OSC
AM OSC
SIGNAL
FM OSC
SIGNAL
C171
K1000P
C172
K1000P
R110
1K
C107
Z0.047
R112
100K
C108
J8.2P
L103
0.47μH
C101
N0.01
C174
16V10
R103
33
Q101,102
2SC2787LTA
FM IF AMP
R104
10K
C103
N0.01
CF201
CF202
C104
K1000P
R105
470
R106
470K
R107
330
C105
K1000P
R108
470K
R109
330
Q101
Q102
Q106
UN411FTA
POWER SUPPLY
(FM:ON)
FM +B LINE
L151
C181
K470P
IC101
LA1832MH-TEL
FM/AM IF AMP, DET/AM OSC, MIX/FM MPX
AM
OSC
AM
MIX
AM RF
AMP
FM/AM
IF AMP
DET.
VCO
DECODER
FREQUENCY
DIVIDER
STEREO
SWITCH
PHASE
DET.
X101
(456kHz)
R121
3.3K
C143
50V1
C144
50V1
AF SIGNAL
(L ch)
Q107,108
2SC3311ARSTA
BUFFER AMP
R147
470K
R143
2.2K
C141
50V1
R139
2.7K
R141
1K
C139
K680P
Q107
L105
8.2mH
C135
K0.01
C137
K560P
R145
820
R148
470K
R144
2.2K
C142
50V1
R140
2.7K
R142
1K
C140
K680P
Q108
L106
8.2mH
C136
K0.01
C138
K560P
R146
820
R171
1K
R172
1K
R118
5.6K
R119
8.2K
C127
16V22
C126
Z0.047
Z102
C125
J15P
C106
N0.01
C196
K1000P
R125
1.5K
X102
(10.65MHz)
R124
270
R173
470
C122
50V2.2
C121
50V1
R122
2.7K
C123
50V1
C128
K1000P
C129
6.3V100
C148
N0.01
R126
1.5K
C149
Z0.1
R175
1K
R149
68
R176
390
C173
16V22
R113
10K
R114
5.6K
C111
25V47
R115
560
C110
N0.01
Q103
Q104
C112
N0.01
R116
1K
D101
MA4051M-TA
C134
J27P
X103
(7.2MHz)
C133
J27P
R128
82
C132
K1000P
C130
6.3V100
R117
82K
C113
K1000P
R129
47K
C145
J22P
C124
K1000P
R130
10K
X OUT
Vss
PD2
PD1
VDD
FM IN
AM IN
MONO
HCTR
LCTR
FM
(LW)
X IN
CE
DI
CL
DO
SYC
INO
INI
AM
NC
STRQ
MUTE
R138
10K
R127
10K
D102
MA165TA
R137
1K
R136
1K
R135
1K
R134
1K
R133
1K
R132
10K
IC102
LC7218M-TE-L
PLL FREQUENCY
SYNTHESIZER
Q103,104
2SC2785FETA
FM/AM
LOOP FILTER
V [FM]
10.7V
2.4V
87.5MHz←→108MHz
F
V [MW]
6.7V
1.1V
522KHz←→1611KHz
F
CN101B
+B(2)
SD
—
ST EYE
VT
+B(1)
GND
To C MAIN
CIRCUIT
(CN201A)
(Page 13)
CN102B
CL
DO
DI
L ch OUT
CE
Rch OUT
—
To C MAIN
CIRCUIT
(CN202A)
(Page 13)

## • Operation circuit (Parts list on Page 26~30)


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
B OPERATION CIRCUIT
FL801 (RSL0183-F)
FL DISPLAY
C813 50V1
C814 50V1
R832–R839 100K
IC801
M38173M6277F
SYSTEM CONTROL
/FL DRIVE
F=4.19MHz
T=6ms
LED RL & CS1
LED UD & CS2
LED SET
D2
D1
ECHO
CR TMER(8/RESET)
/MIC
VSS
XOUT
XIN
/RESET
AC IN
REMOCON
KEY3
KEY2
KEY1
/SD
/STEREO
STB
CE1
CL1
DATA
DATA IN
VR ATT1
MUTE
PASS1
/PASS2
/B DATA IN
/B CLK IN
/B DATA OUT
/B CLK OUT
SURR & CHECK
POWER
VR ATT2
SELECTOR TUNER
VR-JOGb
VR-JOG a
Vcc
VEE
AVss
VREF
D811,812,814 MA165TA
For (EG) area.
For (E,GC) areas
For (GC) area.
D812
D811
D814
R875 470
R876 470
Q815 - 817
UN421FTA
LED DRIVE
D817 - 820
SLR-305MC
D817 (◁SELECT)
D818 (▷SELECT)
D819 (△TUNING)
D820 (▽TUNING)
D821 SLR-305VC (0 SET)
D831 MA165TA
D832 MA165TA
D833 MA165TA
R877 270
R878 270
R880 220
R882 390
Q812
UN411FTA
LED DRIVE
R872 120
R870 2.7K
R871 82
Q811
2SC3311AIQST
LED DRIVE
D807
SPR-305MDTF
(TUNER)
Q814
2SD2144STA
LED DRIVE
R869 47K
R868 47K
S817 (▷ PLAY)
S816 (◁ REC)
S815 (CLOCK/TIMER)
S814 (0 SET)
S813 (◁ SELECT)
S812 (▷ SELECT)
S811 (▽ TUNING)
S810 (△ TUNING)
S809 (LW/MW)
S808 (FM)
S807 (AUTO PRESET)
S806 (FLAT)
S805 (EQ SPACE)
S804 (V.BASS)
S802 (KARAOKE)
S801 (SELECTOR)
R828 6.8K
R827 4.7K
R826 3.3K
R825 2.2K
R824 1.8K
R823 1.5K
R822 1.2K
R821 1K
R820 820
R819 2.2K
R818 1.8K
R817 1.5K
R816 1.2K
R815 1K
R814 820
R813 10K
R848 1K
C812 100P
C808 0.01
R812 10K
R811 10K
R842 39K
R843 39K
R844 10K
R845 2.2K
R846 2.2K
R847 2.2K
R849 3.9K
R852 3.9K
R857 330
R856 10K
R850 2.2K
R851 2.2K
R853 10K
R855 3.9K
R860 22K
R861 22K
R865 100K
D803 ISS291TA
D801 ISS291TA
D802 MA165TA
C801 6.3V1000
L801 10μH
C803 0.1
D810 MA165TA
R841 220K
C810 16V10
R840 100K
R864 220
C862 27P
X801 (4.19MHz)
C861 22P
C809 0.01
D804 MA165TA
D805 MA165TA
D806 MA165TA
IC802
LA5608M-TE-L
BUS LINE DRIVE/
RESET/HALF
B.DATA
B.CLK
B.GND
GND
RESET
CD
HALT
BDATA OUT
B.CLKOUT
BDATAIN
BCLKIN
VDD
CA
AC
C851 50V0.33
C852 0.1
R858 1K
C811 0.01
R866 47
C806 0.022
Z801
RCDHC-278N
(REMOTE SENSOR)
C807 1000P
R867 22K
C815 0.01
C805 6.3V100
C872 0.01
C802 1000P
R859 1K
Q805
UN421FTA
SWITCHING
C871 6.3V100
Q801
Q802
Q803
Q804
R801 100K
R802 100K
R803 100K
R804 100K
Q801-804
UN4111TA
FL DRIVE
CN804
/PASS2
MUTE
VRATT1
DATAIN
DATA
CL1
CE1
STB
To C MAIN CIRCUIT (CP804) (Page 16)
CN803
/STEREO
/SD
MICDET
VOLA
VOLB
VRATT2
POWER
SURR
To C MAIN CIRCUIT (CP803) (Page 16)
CN802
PASS1
BDATA
BCLK
BGND
D2
D1
ECHO
/RESET
To C MAIN CIRCUIT (CP802) (Page 16)
CN801
SYNC
KEY
VDD
D.GND
VP
FL2
FL1
+B(3)
To C MAIN CIRCUIT (CP801) (Page 16)
-24.7V
-21.2V
4.9V
5V
7.4V
5.8V

- This schema

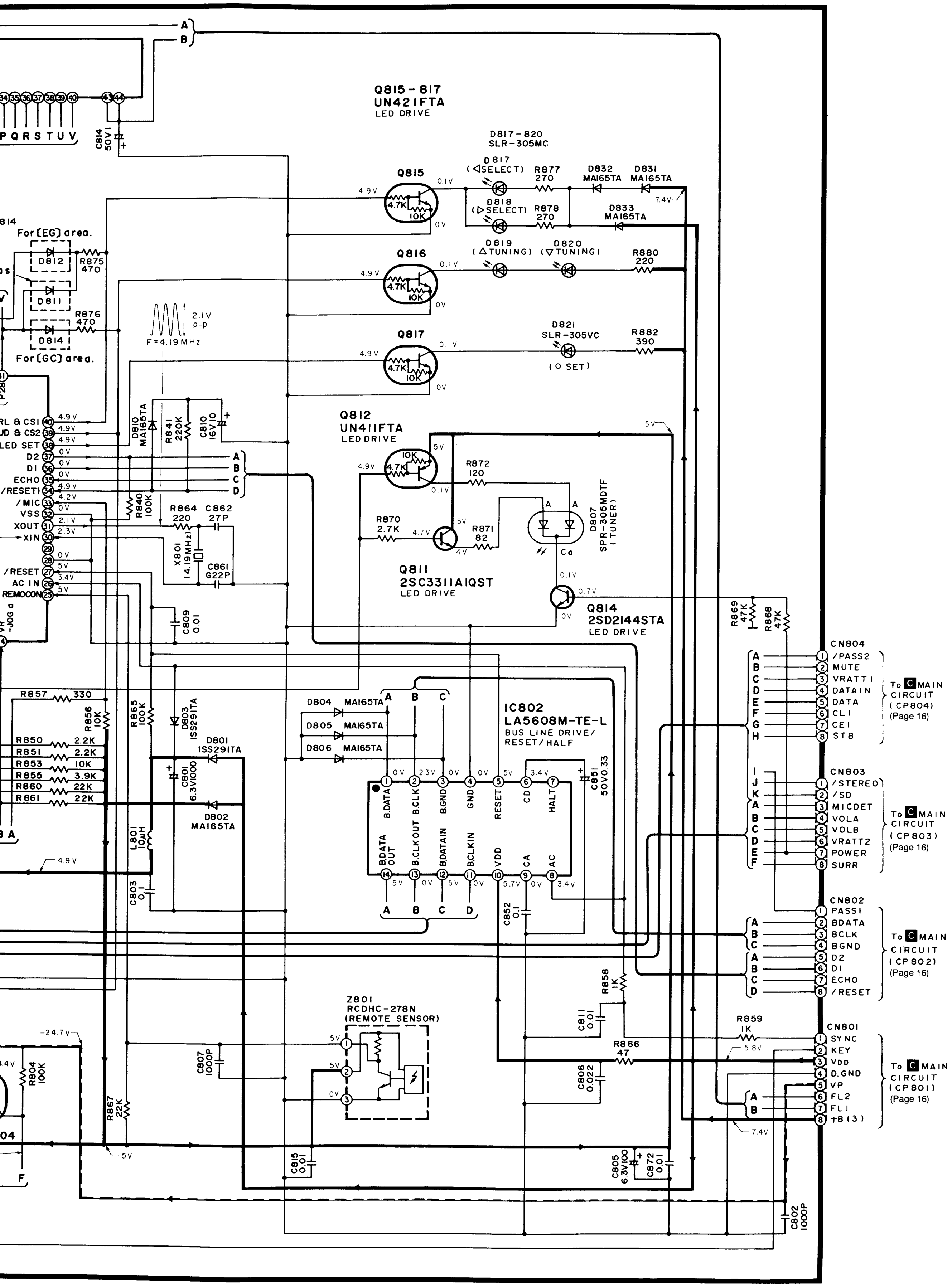
**Notes:**
- **S801** :
- **S802** :
- **S804** :
- **S805** :
- **S806** :
- **S807** :
- **S808** :
- **S809** :
- **S810** :
- **S811** :
- **S812** :
- **S813** :
- **S814** :
- **S815** :
- **S816** :
- **S817** :
- Indicated vo circuit tester some errors
- Voltage valu points betwe

No ma

- Important sa Component Furthermore (capacitors) use only ma

- **Caution!**
IC and LSI a
Secondary t
Cover the p
Ground the
Put a condu
Do not touc

- **Voltage an**


Q815 - 817
UN421FTA
LED DRIVE
D817 - 820
SLR-305MC
Q815
Q816
Q817
D817 (◁SELECT)
D818 (▷SELECT)
D819 (△TUNING)
D820 (▽TUNING)
D821 SLR-305VC
(○ SET)
R877 270
R878 270
R880 220
R882 390
D832 MA165TA
D831 MA165TA
D833 MA165TA
For [EG] area.
For [GC] area.
D812
D811
D814
R875 470
R876 470
2.1V P-P
F=4.19MHz
Q812
UN411FTA
LED DRIVE
R872 120
R870 2.7K
R871 82
Q811
2SC3311AIQST
LED DRIVE
D807
SPR-305MDTF
(TUNER)
Q814
2SD2144STA
LED DRIVE
X801 (4.19MHz)
R864 220
C862 27P
C861 22P
C809 0.01
D810 MA165TA
R841 220K
C810 16V10
R840 100K
R857 330
R856 10K
R865 100K
D803 1SS291TA
D801 1SS291TA
C801 6.3V100
D802 MA165TA
L801 10μH
C803 0.1
R850 2.2K
R851 2.2K
R853 10K
R855 3.9K
R860 22K
R861 22K
D804 MA165TA
D805 MA165TA
D806 MA165TA
IC802
LA5608M-TE-L
BUS LINE DRIVE/RESET/HALF
B.DATA
B.CLK
B.GND
GND
RESET
CD
HALT
BDATA OUT
B.CLKOUT
BDATAIN
BCLKIN
VDD
CA
AC
C851 50V0.33
C852 0.1
R858 1K
C811 0.01
R866 47
C806 0.022
C805 6.3V100
C872 0.01
C815 0.01
C807 1000P
R867 22K
R804 100K
Z801
RCDHC-278N
(REMOTE SENSOR)
R869 47K
R868 47K
R859 1K
C802 1000P
C814 50V1
CN804
/PASS2
MUTE
VRATT1
DATAIN
DATA
CL1
CE1
STB
CN803
/STEREO
/SD
MICDET
VOLA
VOLB
VRATT2
POWER
SURR
CN802
PASS1
BDATA
BCLK
BGND
D2
D1
ECHO
/RESET
CN801
SYNC
KEY
VDD
D.GND
VP
FL2
FL1
+B(3)
To C MAIN CIRCUIT (CP804) (Page 16)
To C MAIN CIRCUIT (CP803) (Page 16)
To C MAIN CIRCUIT (CP802) (Page 16)
To C MAIN CIRCUIT (CP801) (Page 16)
RL & CS1
UD & CS2
LED SET
D2
D1
ECHO
/RESET
/MIC
VSS
XOUT
XIN
/RESET
AC IN
REMOCON
P Q R S T U V
-24.7V
5.8V
7.4V

- This schematic diagram may be modified at any time with the development of new technology.

**Notes:**

- **S801** : Source input select switch (SELECTOR)
- **S802** : KARAOKE mode select switch (KARAOKE)
- **S804** : V.bass switch (V.BASS)
- **S805** : EQ SPACE mode select switch (EQ SPACE)
- **S806** : Flat switch (FLAT)
- **S807** : Auto preset switch (AUTO PRESET)
- **S808** : FM switch (FM)
- **S809** : AM (LW/MW) select switch (LW/MW)
- **S810** : TUNING (▲) switch
- **S811** : TUNING (▼) switch
- **S812** : SELECT (▶) switch
- **S813** : SELECT (◀) switch
- **S814** : SET (●) switch
- **S815** : Clock/timer switch (CLOCK/TIMER)
- **S816** : Record timer switch (⏲ REC)
- **S817** : Play timer switch (⏲ PLAY)
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
- Voltage values and waveforms are measured as indicated in the schematic diagram when test points between TP901 and TP902, and between TP903 and TP904 are shorted.

No mark : FM mode ( ) : AM (MW) mode < > : AM (LW) mode

- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

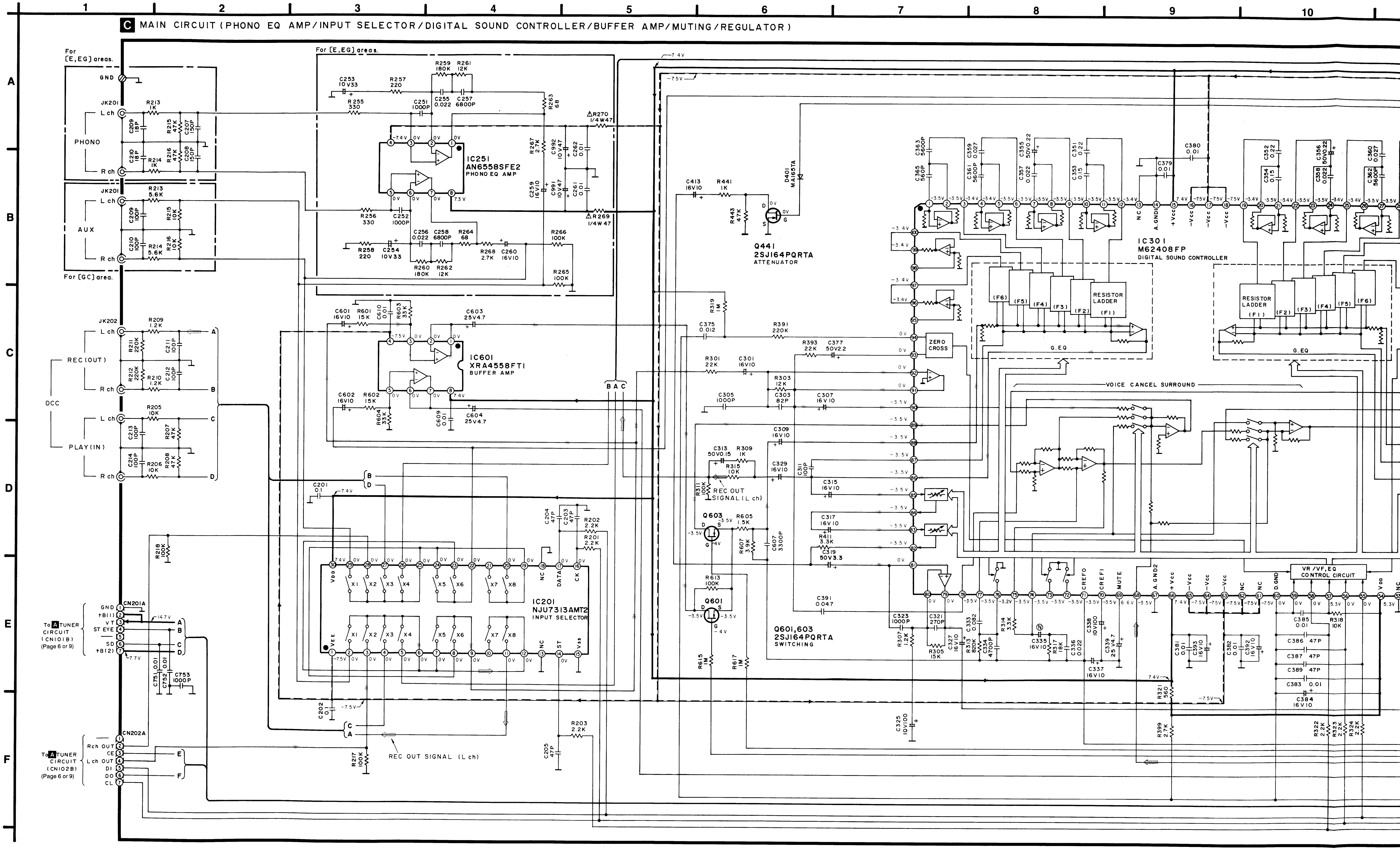
- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

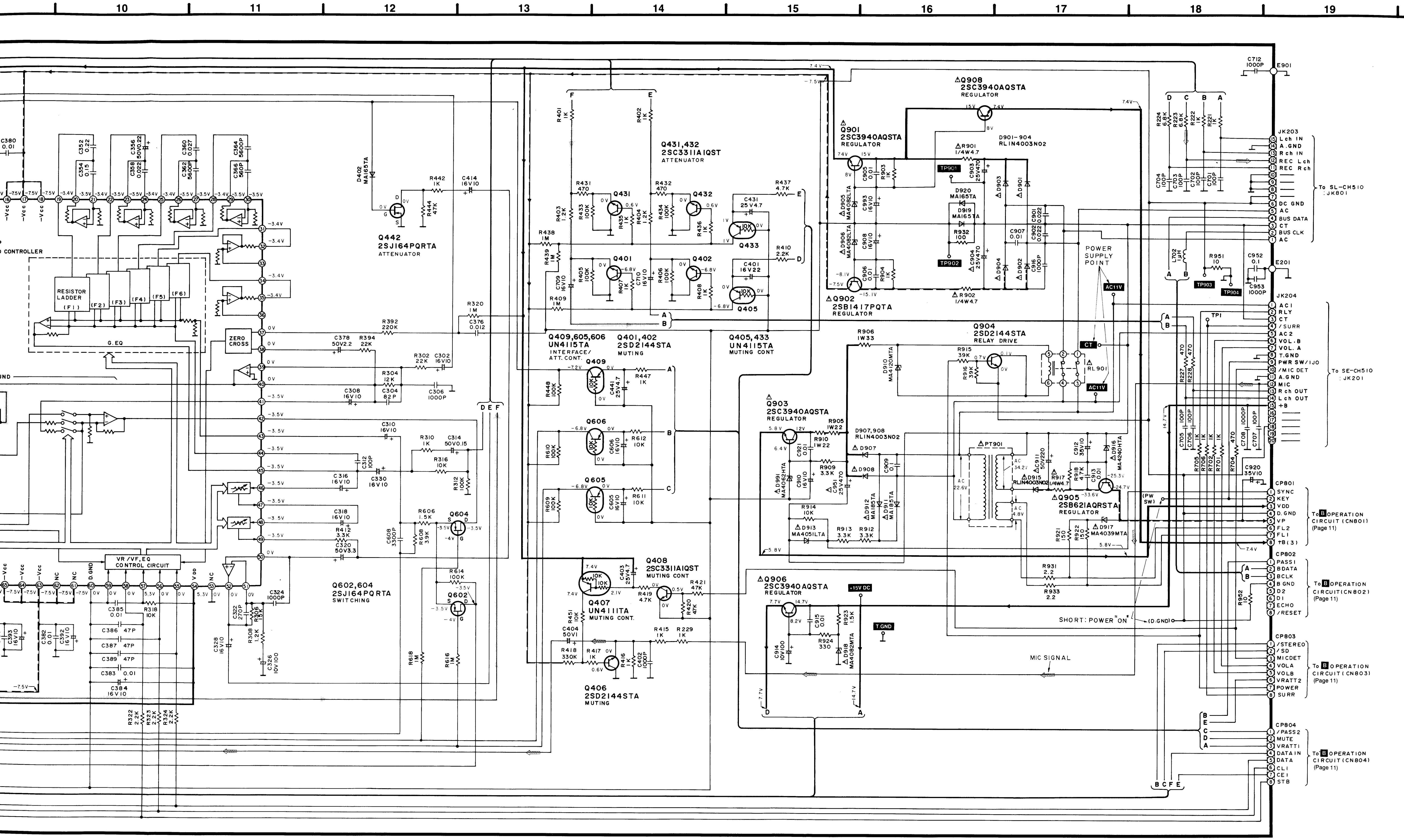
- **Voltage and signal line**

━━▶ : Positive voltage line
– – ▶ – – : Negative voltage line
▒▒▶ : AF signal (Lch) line
▒▒⇨ : REC. OUT signal line
▨⇨ : MIC signal line

## ● Main circuit (Parts list on Page 26~30)

**C** MAIN CIRCUIT (PHONO EQ AMP/INPUT SELECTOR/DIGITAL SOUND CONTROLLER/BUFFER AMP/MUTING/REGULATOR)


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
For [E,EG] areas.
GND
JK201
PHONO
L ch
R ch
AUX
For [GC] area.
JK202
REC (OUT)
DCC
PLAY (IN)
IC251
AN6558SFE2
PHONO EQ AMP
IC601
XRA4558FTI
BUFFER AMP
IC201
NJU7313AMT2
INPUT SELECTOR
Q441
2SJ164PQRTA
ATTENUATOR
D401
MA165TA
Q603
Q601
Q601,603
2SJ164PQRTA
SWITCHING
REC OUT SIGNAL (L ch)
IC301
M62408FP
DIGITAL SOUND CONTROLLER
RESISTOR LADDER
G.EQ
ZERO CROSS
VOICE CANCEL SURROUND
VR/VF,EQ CONTROL CIRCUIT
To A TUNER CIRCUIT (CN101B) (Page 6 or 9)
CN201A
GND
+B(1)
VT
ST EYE
SD
+B(2)
To A TUNER CIRCUIT (CN102B) (Page 6 or 9)
CN202A
Rch OUT
CE
L ch OUT
DI
DO
CL
ΔR270 1/4W47
ΔR269 1/4W47
-7.4V
-7.5V

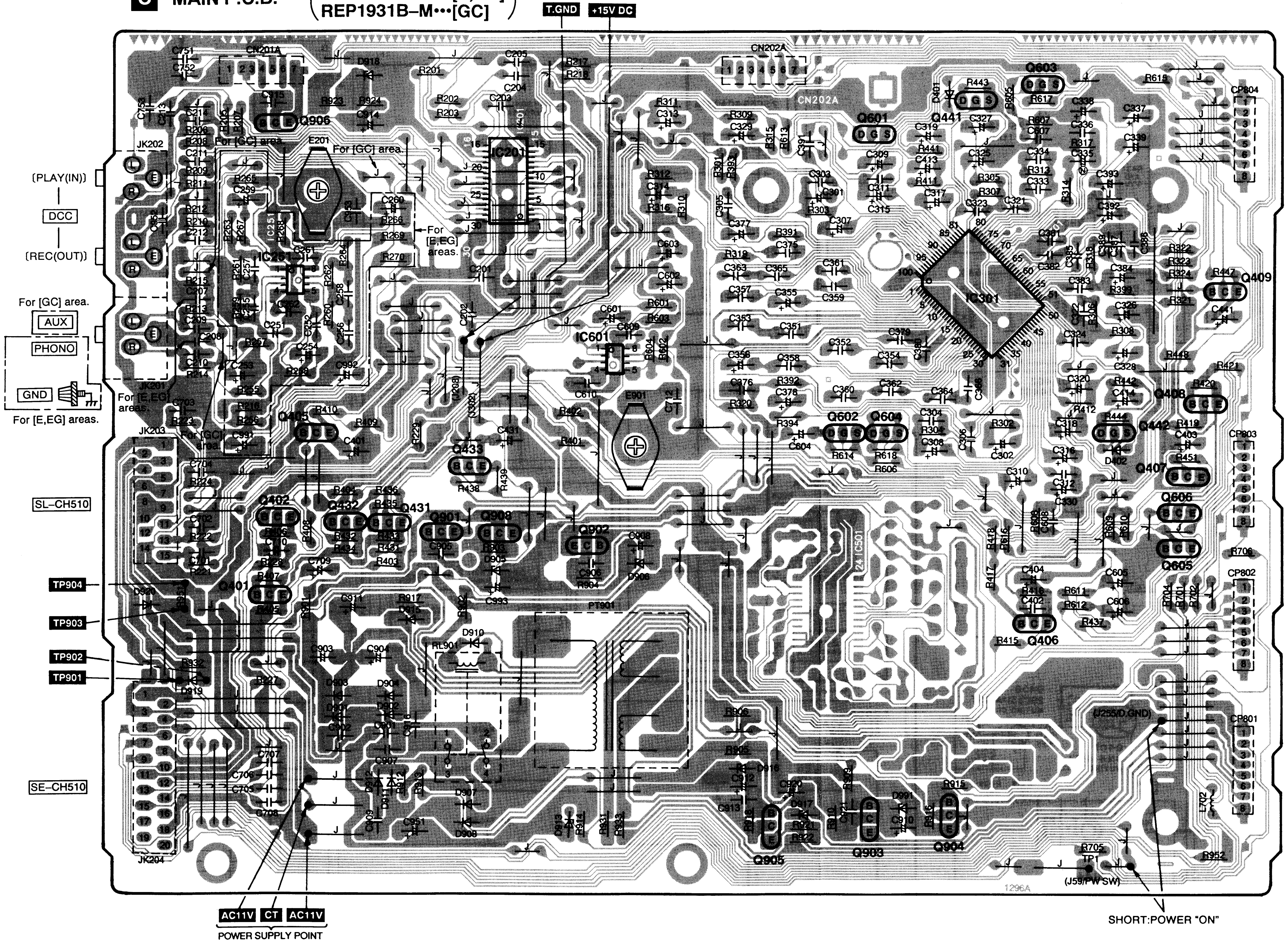

10
11
12
13
14
15
16
17
18
19
Q442
2SJ164PQRTA
ATTENUATOR
D402
MA165TA
R442 1K
C414 16V10
R444 47K
Q431,432
2SC3311AIQST
ATTENUATOR
Q431
Q432
Q401
Q402
Q433
Q405
R401 1K
R402 1K
R437 4.7K
C431 25V4.7
R410 2.2K
C401 16V22
Q409,605,606
UN4115TA
INTERFACE/
ATT. CONT.
Q401,402
2SD2144STA
MUTING
Q405,433
UN4115TA
MUTING CONT
Q409
Q606
Q605
Q407
UN4111TA
MUTING CONT.
Q408
2SC3311AIQST
MUTING CONT
Q406
2SD2144STA
MUTING
Q602,604
2SJ164PQRTA
SWITCHING
Q604
Q602
RESISTOR LADDER
(F1)
(F2)
(F3)
(F4)
(F5)
(F6)
G.EQ
ZERO CROSS
CONTROLLER
VR/VF,EQ
CONTROL CIRCUIT
C380 0.01
C352 0.22
C354 0.15
C356 50V0.22
C358 0.022
C360 0.027
C362 5600P
C364 5600P
C366 560P
R392 220K
R394 22K
C378 50V2.2
R320 1M
C376 0.012
R302 22K
C302 16V10
R304 12K
C304 82P
C306 1000P
C308 16V10
C310 16V10
R310 1K
C314 50V0.15
R316 10K
C312 100P
C330 16V10
C316 16V10
R312 100K
C318 16V10
R412 3.3K
C320 50V3.3
C608 3300P
R606 1.5K
R608 39K
R614 100K
R618 1M
R616 1M
C324 1000P
C322 270P
R306 15K
R308 1.2K
C326 10V100
C328 16V10
C385 0.01
R318 10K
C386 47P
C387 47P
C389 47P
C383 0.01
C384 16V10
R322 2.2K
R323 2.2K
R324 2.2K
ΔQ908
2SC3940AQSTA
REGULATOR
ΔQ901
2SC3940AQSTA
REGULATOR
ΔQ902
2SB1417PQTA
REGULATOR
D901-904
RLIN4003N02
ΔR901 1/4W4.7
ΔR902 1/4W4.7
D920 MA165TA
D919 MA165TA
R932 100
TP901
TP902
TP903
TP904
POWER SUPPLY POINT
AC11V
CT
RL901
Q904
2SD2144STA
RELAY DRIVE
R906 1W33
R915 39K
R916 39K
D910 MA4120MTA
ΔQ903
2SC3940AQSTA
REGULATOR
R905 1W22
R910 1W22
D907,908
RLIN4003N02
ΔD907
ΔD908
ΔPT901
ΔD915 RLIN4003N02
ΔR917 1/4W4.7
ΔQ905
2SB621AQRSTA
REGULATOR
ΔD917 MA4039MTA
ΔD916 MA4240HTA
ΔD913 MA4051LTA
ΔD912 MA185TA
ΔD911 MA185TA
ΔD991 MA4062HTA
R909 3.3K
R914 10K
R913 3.3K
R912 3.3K
R931 2.2
R933 2.2
ΔQ906
2SC3940AQSTA
REGULATOR
+15V DC
T.GND
C914 10V100
C915 0.01
R923 1.5K
R924 330
D918 MA4082MTA
SHORT: POWER "ON"
(D.GND)
(PW SW)
MIC SIGNAL
C712 1000P
E901
E201
JK203
Lch IN
A.GND
Rch IN
REC Lch
REC Rch
DC GND
AC
BUS DATA
CT
BUS CLK
AC
To SL-CH510 : JK801
JK204
AC1
RLY
CT
/SURR
AC2
VOL.B
VOL.A
T.GND
PWR SW/1JO
/MIC DET
A.GND
MIC
Rch OUT
Lch OUT
+B
To SE-CH510 : JK201
L702 1μH
R951 10
C952 0.1
C953 1000P
TP1
R224 6.8K
R223 6.8K
R222 1K
R221 1K
C704 100P
C703 100P
C702 100P
C701 100P
R227 470
R228 470
C920 35V10
CP801
SYNC
KEY
VDD
D.GND
VP
FL2
FL1
+B(3)
To B OPERATION CIRCUIT (CN801) (Page 11)
CP802
PASS1
BDATA
BCLK
B GND
D2
D1
ECHO
/RESET
To B OPERATION CIRCUIT (CN802) (Page 11)
CP803
/STEREO
/SD
MICDET
VOLA
VOLB
VRATT2
POWER
SURR
To B OPERATION CIRCUIT (CN803) (Page 11)
CP804
/PASS2
MUTE
VRATTI
DATA IN
DATA
CLI
CEI
STB
To B OPERATION CIRCUIT (CN804) (Page 11)
R952 10

# Printed Circuit Board Diagram

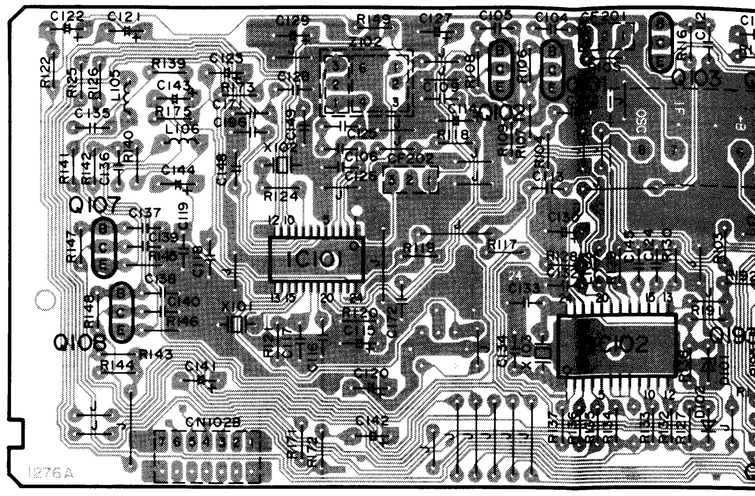
1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F

- This circuit board diagram may be modified at any time with the development of new technology.

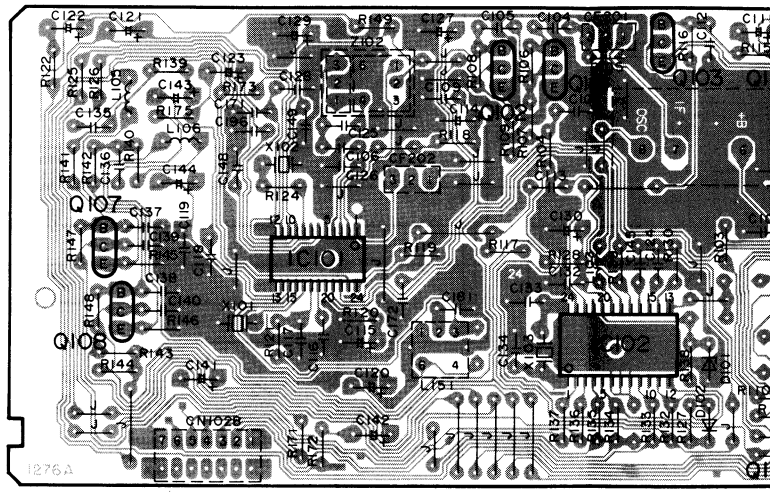
**C** MAIN P.C.B. (REP1931A–M···[E,EG]
REP1931B–M···[GC])


T.GND
+15V DC
[PLAY(IN)]
DCC
[REC(OUT)]
For [GC] area.
AUX
PHONO
GND
For [E,EG] areas.
SL-CH510
SE-CH510
TP904
TP903
TP902
TP901
AC11V
CT
AC11V
POWER SUPPLY POINT
SHORT:POWER "ON"
CN201A
CN202A
JK201
JK202
JK203
JK204
IC201
IC251
IC301
IC601
E201
E901
PT901
RL901
CP801
CP802
CP803
CP804
Q401
Q402
Q405
Q406
Q407
Q408
Q409
Q431
Q432
Q433
Q441
Q442
Q601
Q602
Q603
Q604
Q605
Q606
Q901
Q902
Q903
Q904
Q905
Q906
Q908
For [GC] area
For [E,EG] areas
(J59/PW SW)
(J255/D.GND)
TP1
1296A

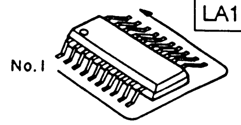
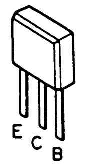
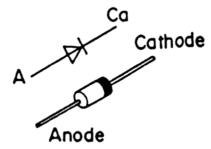
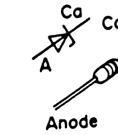
**A** TUNER P.C.B. For [E,GC] areas.(REP1930A–T)


Q107
Q108
IC101
IC102
Q103
CN102B
1276A

**A** TUNER P.C.B. For [EG] area.(REP1930B–T)

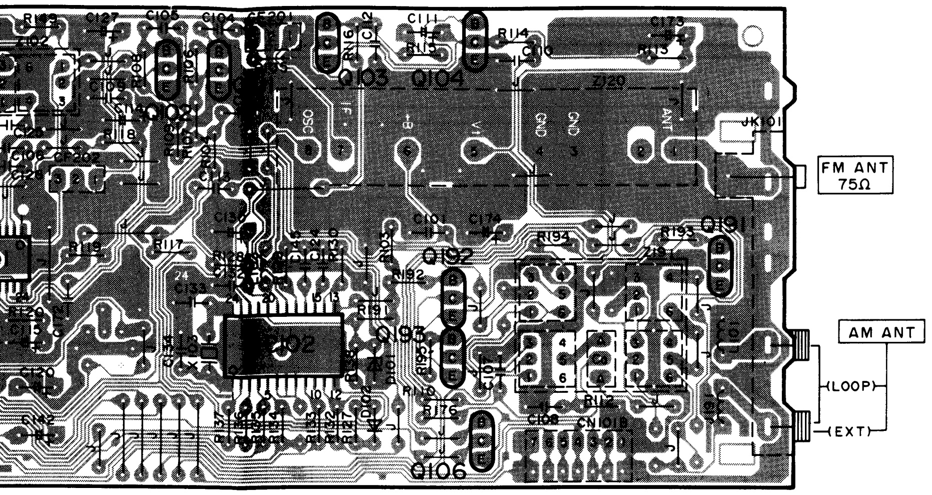

Q107
Q108
IC101
IC102
Q103
CN102B
1276A

- **Terminal Guide of IC's, Tra**

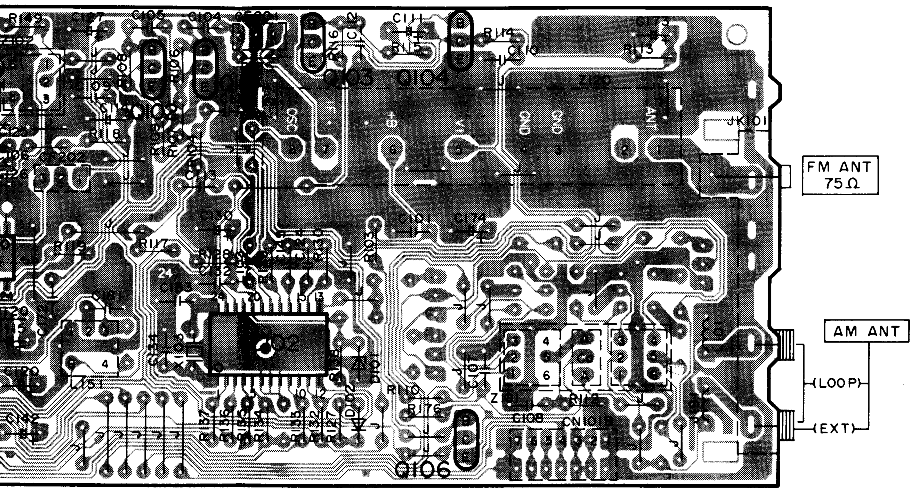
| | |
|---|---|
|  No. 1 | AN6558SFE2<br>LA5608M-TE-L<br>LA1832MH-TEL |
|  E C B | UN411FTA<br>UN4111<br>UN4115<br>UN421FTA<br>2SC2785FE<br>2SC2787L<br>2SC3311ARSTA<br>2SC3311AIQST |
| RL1N4003N02<br> Ca Cathode A Anode |  Ca A Anode |

10 11 12 13 14 15 16 17 18 19

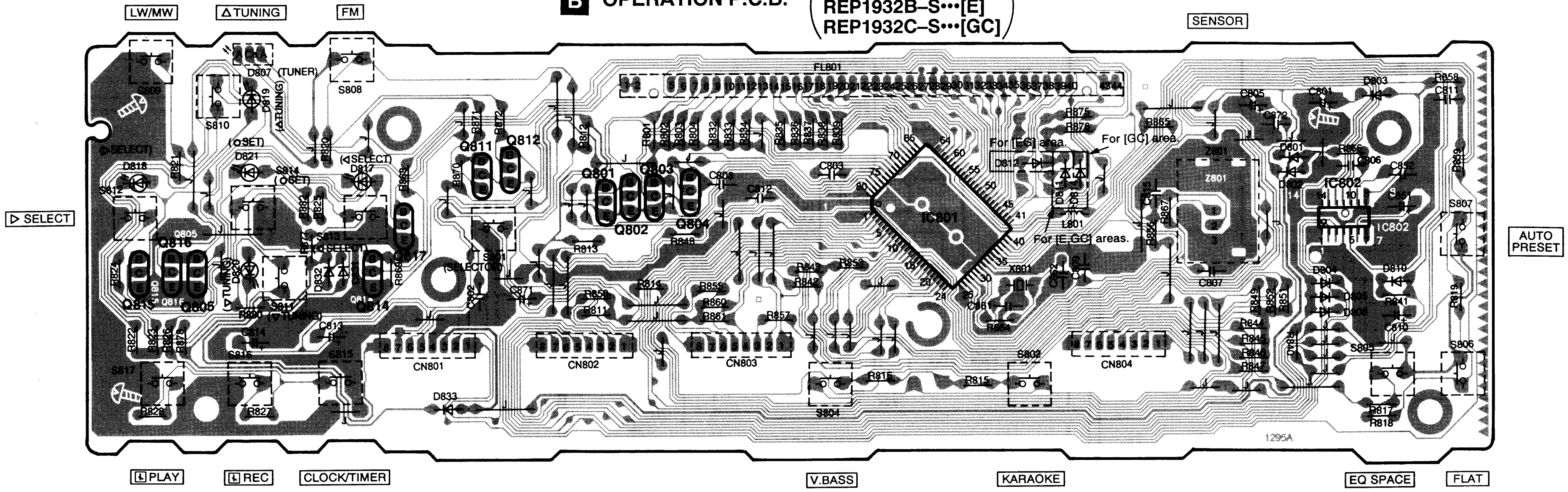
GC] areas.(REP1930A–T)


Q103
Q104
Z120
JK101
FM ANT 75Ω
AM ANT
(LOOP)
(EXT)
IC102
Q192
Q193
Q191
Q106
CN101B

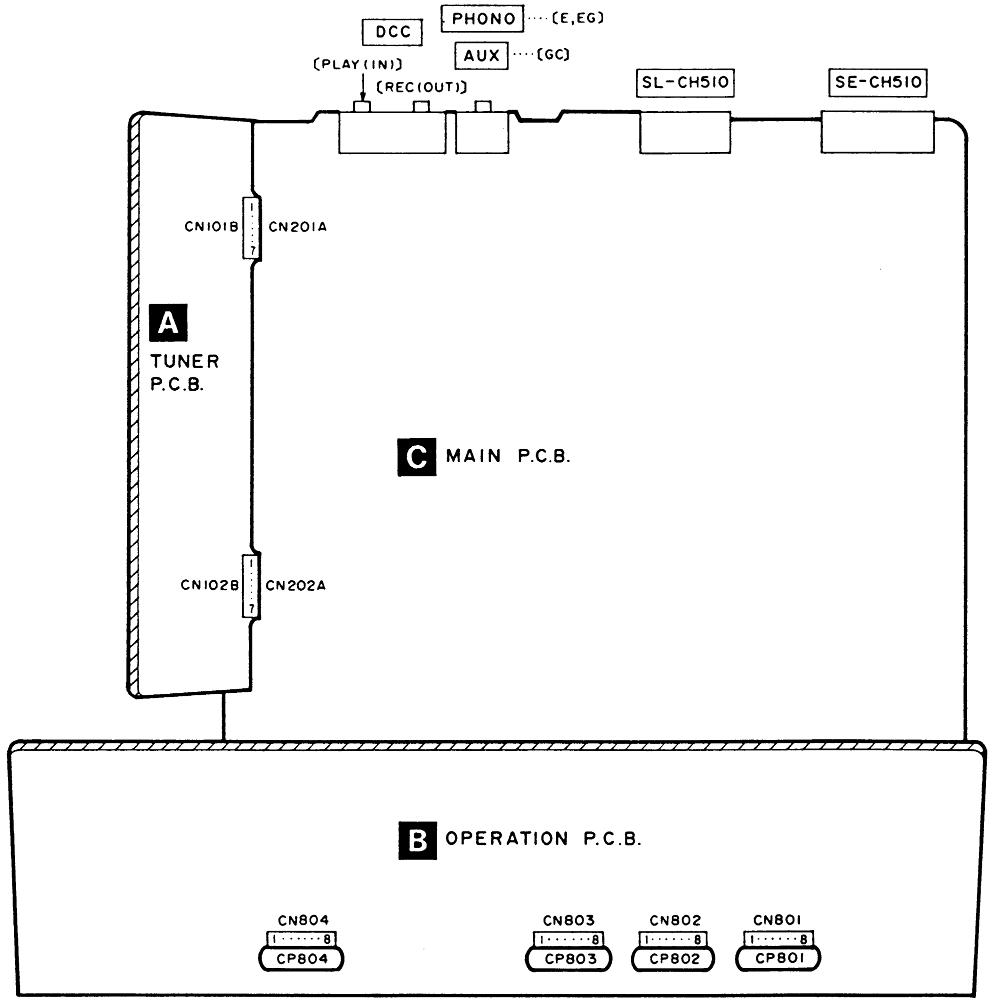
] area.(REP1930B–T)


Q103
Q104
Z120
JK101
FM ANT 75Ω
AM ANT
(LOOP)
(EXT)
IC102
Q106
CN101B

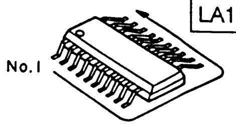
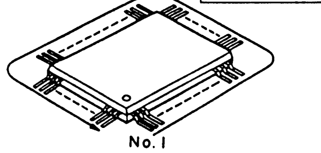
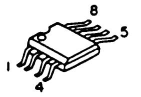
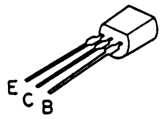
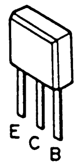
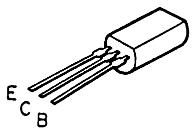
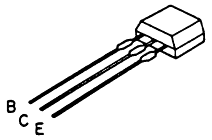
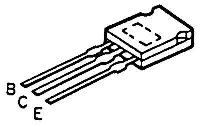
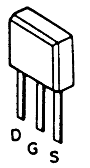
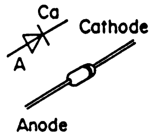
**B** OPERATION P.C.B. (REP1932A–S•••[EG] REP1932B–S•••[E] REP1932C–S•••[GC])


LW/MW
ΔTUNING
FM
SENSOR
▷ SELECT
AUTO PRESET
FL801
IC801
IC802
Q801
Q802
Q803
Q804
Q805
Q811
Q812
Q815
Q816
For [EG] area.
For [GC] area.
For [E,GC] areas.
CN801
CN802
CN803
CN804
D833
S804
S805
S806
S807
S808
S810
S812
S817
1295A
ⓛ PLAY
ⓛ REC
CLOCK/TIMER
V.BASS
KARAOKE
EQ SPACE
FLAT

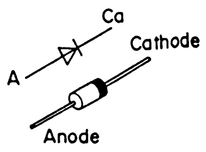
## ■ Wiring Connection Diagram


DCC
PHONO ····(E,EG)
AUX ····(GC)
(PLAY(IN))
(REC(OUT))
SL-CH510
SE-CH510
CN101B
CN201A
CN102B
CN202A
A TUNER P.C.B.
C MAIN P.C.B.
B OPERATION P.C.B.
CN804
CP804
CN803
CP803
CN802
CP802
CN801
CP801

### • Terminal Guide of IC's, Transistors and Diodes

<table>
<tr>
<td colspan="3">AN6558SFE2 8Pin<br>LA5608M-TE-L 14Pin<br>LA1832MH-TEL 24Pin<br>LC7218M-TE-L 24Pin<br>NJU7313AMT2 30Pin<br> </td>
<td colspan="2">M38173M6277F 80Pin<br>M62408FP 100Pin<br> </td>
<td>XRA4558FT1<br> </td>
<td>2SB621A-R<br> </td>
</tr>
<tr>
<td colspan="2">UN411FTA<br>UN4111<br>UN4115<br>UN421FTA<br>2SC2785FE<br>2SC2787L<br>2SC3311ARSTA<br>2SC3311AIQST<br> </td>
<td>2SC3940AQSTA<br> </td>
<td>2SD2144S<br> </td>
<td>2SB1417PQTA<br> </td>
<td>2SJ164PQRTA<br> </td>
<td>MA165<br>

Ca
Cathode
A
Anode

</td>
</tr>
<tr>
<td>RL1N4003N02<br>

Ca
Cathode
A
Anode

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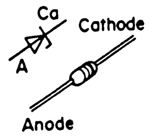
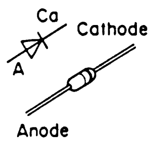
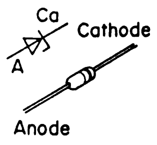
<td colspan="2">MA4039MTA<br>MA4051MTA<br>MA4051-L<br>MA4062-H<br>MA4082MTA<br>MA4082LTA<br>

Ca
Cathode
A
Anode

</td>
<td>1SS291TA<br>MA185TA<br>

Ca
Cathode
A
Anode

</td>
<td>MA4120<br>MA4240H<br>

Ca
Cathode
A
Anode

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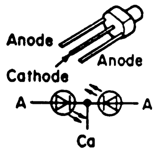
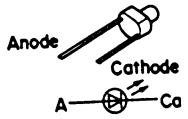
<td>SPR-305MDTF<br>

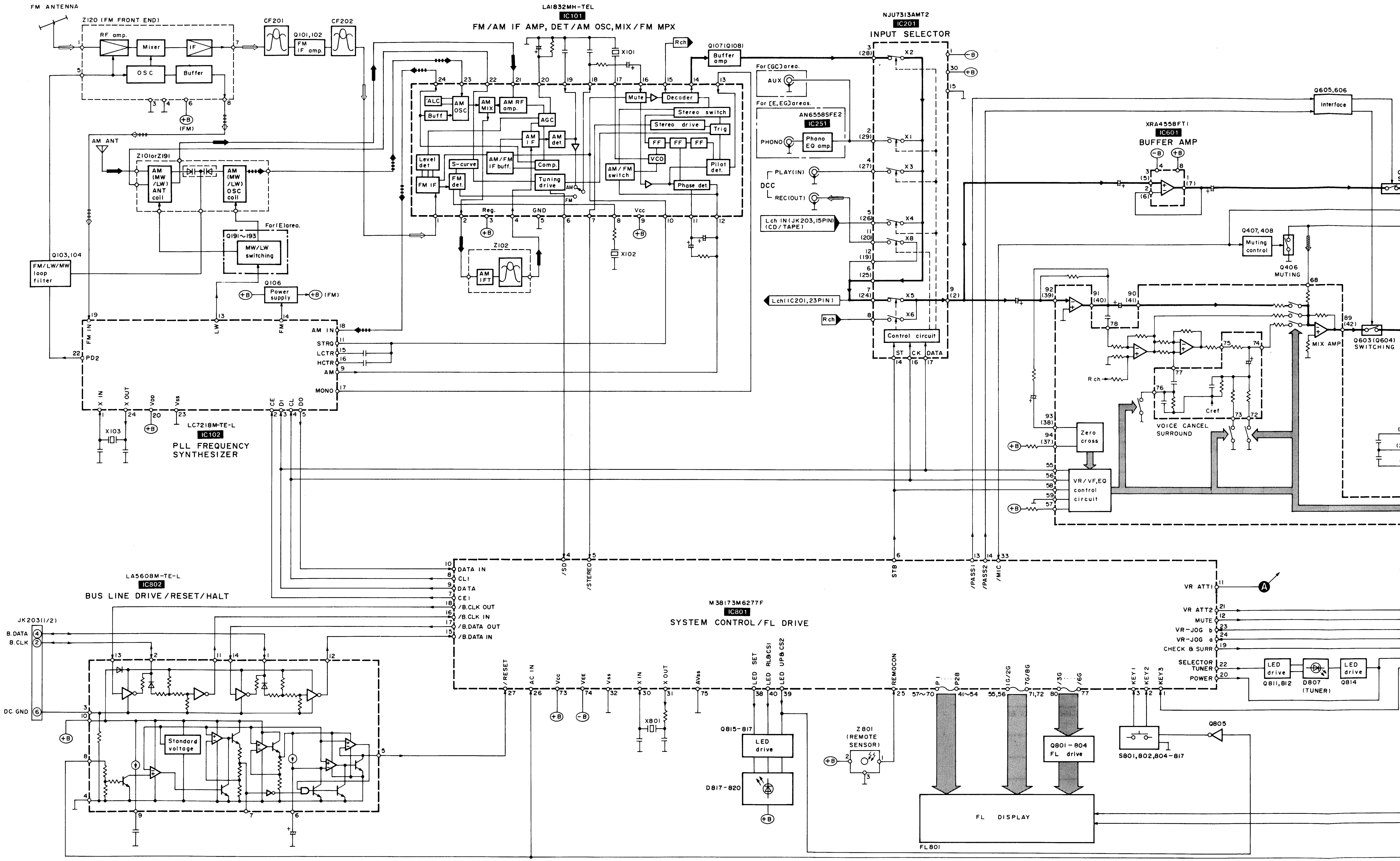
Anode
Anode
Cathode
A
A
Ca

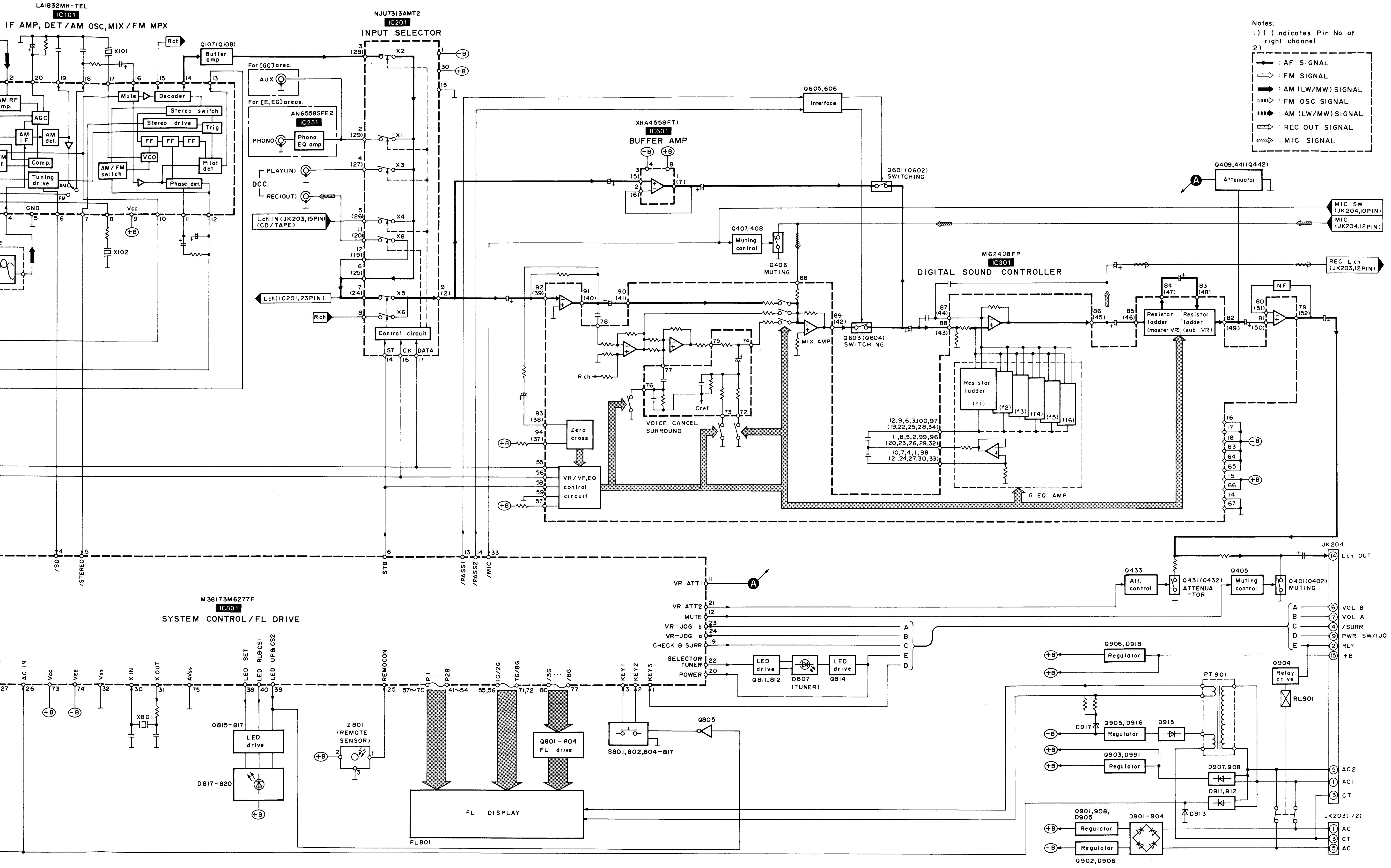
</td>
<td>SLR-305MC<br>SLR-305VC<br>

Anode
Cathode
A
Ca

</td>
</tr>
</table>

# ■ Block Diagram


FM ANTENNA
Z120 (FM FRONT END)
RF amp.
Mixer
IF
OSC
Buffer
(FM)
CF201
Q101,102
FM IF amp.
CF202
LA1832MH-TEL
IC101
FM/AM IF AMP, DET/AM OSC, MIX/FM MPX
ALC
AM OSC
AM MIX
AM RF amp.
Buff
AGC
AM IF
AM det.
Level det
S-curve
AM/FM IF buff.
Comp.
FM IF
FM det.
Tuning drive
AM
FM
Mute
Decoder
Stereo switch
Stereo drive
Trig
FF
VCO
AM/FM switch
Pilot det.
Phase det.
Reg.
GND
Vcc
X101
X102
Z102
AM IFT
Rch
Q107 (Q108)
Buffer amp
AM ANT
Z101or Z191
AM (MW/LW) ANT coil
AM (MW/LW) OSC coil
For (E) area.
Q191~193
MW/LW switching
Q106
Power supply
(FM)
Q103,104
FM/LW/MW loop filter
FM IN
PD2
LW
FM
AM IN
STRQ
LCTR
HCTR
AM
MONO
X IN
X OUT
VDD
Vss
CE
DI
CL
DO
X103
LC7218M-TE-L
IC102
PLL FREQUENCY SYNTHESIZER
NJU7313AMT2
IC201
INPUT SELECTOR
For (GC) area.
AUX
For (E, EG) areas.
AN6558SFE2
IC251
PHONO
Phono EQ amp.
PLAY (IN)
DCC
REC (OUT)
Lch IN (JK203, 15PIN) (CD/TAPE)
Lch (IC201, 23PIN)
Rch
X1
X2
X3
X4
X5
X6
X8
Control circuit
ST
CK
DATA
Q605,606
Interface
XRA4558FT1
IC601
BUFFER AMP
Q407,408
Muting control
Q406
MUTING
MIX AMP
Q603 (Q604)
SWITCHING
R ch
Cref
VOICE CANCEL
SURROUND
Zero cross
VR/VF,EQ control circuit
LA5608M-TE-L
IC802
BUS LINE DRIVE/RESET/HALT
JK203 (1/2)
B.DATA
B.CLK
DC.GND
Standard voltage
DATA IN
CLI
DATA
CEI
/B.CLK OUT
/B.CLK IN
/B.DATA OUT
/B.DATA IN
/SD
/STEREO
STB
/PASS1
/PASS2
/MIC
M38173M6277F
IC801
SYSTEM CONTROL/FL DRIVE
/RESET
AC IN
Vcc
VEE
Vss
X IN
X OUT
AVss
X801
LED SET
LED RL8CS1
LED UP8CS2
Q815-817
LED drive
D817-820
REMOCON
Z801 (REMOTE SENSOR)
P1~P28
1G/2G~7G/8G
/3G~/6G
Q801-804
FL drive
FL DISPLAY
FL801
KEY1
KEY2
KEY3
S801,802,804-817
Q805
VR ATT1
A
VR ATT2
MUTE
VR-JOG b
VR-JOG a
CHECK & SURR
SELECTOR TUNER
POWER
LED drive
Q811,812
D807 (TUNER)
Q814


LA1832MH-TEL
IC101
IF AMP, DET/AM OSC, MIX/FM MPX
AM RF amp.
AGC
AM IF
AM det.
Comp.
Tuning drive
Mute
Decoder
Stereo switch
Stereo drive
Trig
FF
VCO
AM/FM switch
Pilot det.
Phase det.
GND
Vcc
X101
X102
Q107(Q108) Buffer amp
Rch
NJU7313AMT2
IC201
INPUT SELECTOR
Control circuit
ST CK DATA
For [GC] area.
AUX
For [E, EG] areas.
AN6558SFE2
IC251
PHONO
Phono EQ amp.
PLAY(IN)
DCC
REC(OUT)
Lch IN (JK203, 15PIN) (CD/TAPE)
Lch (IC201, 23PIN)
Q605, 606 Interface
XRA4558FT1
IC601
BUFFER AMP
Q601(Q602) SWITCHING
Q407, 408 Muting control
Q406 MUTING
M62408FP
IC301
DIGITAL SOUND CONTROLLER
Zero cross
VR/VF, EQ control circuit
VOICE CANCEL SURROUND
Cref
MIX AMP
Q603(Q604) SWITCHING
Resistor ladder (f1)
(f2) (f3) (f4) (f5) (f6)
G EQ AMP
Resistor ladder (master VR)
Resistor ladder (sub VR)
NF
Q409, 441(Q442) Attenuator
MIC SW (JK204, 10PIN)
MIC (JK204, 12PIN)
REC Lch (JK203, 12PIN)
Notes:
1) ( ) indicates Pin No. of right channel.
2)
: AF SIGNAL
: FM SIGNAL
: AM (LW/MW) SIGNAL
: FM OSC SIGNAL
: AM (LW/MW) SIGNAL
: REC OUT SIGNAL
: MIC SIGNAL
/SD
/STEREO
STB
/PASS1
/PASS2
/MIC
M38173M6277F
IC801
SYSTEM CONTROL/FL DRIVE
VR ATT1
VR ATT2
MUTE
VR-JOG b
VR-JOG a
CHECK & SURR
SELECTOR TUNER
POWER
AC IN
Vcc
VEE
Vss
X IN
X OUT
AVss
X801
LED SET
LED RL&CS1
LED UP&CS2
REMOCON
P1 P28
1G/2G 7G/8G
/3G /6G
KEY1 KEY2 KEY3
Q815-817 LED drive
D817-820
Z801 (REMOTE SENSOR)
Q801-804 FL drive
FL DISPLAY
FL801
S801, 802, 804-817
Q805
LED drive Q811, 812
D807 (TUNER)
LED drive Q814
Q433 Att. control
Q431(Q432) ATTENUATOR
Q405 Muting control
Q401(Q402) MUTING
JK204
Lch OUT
VOL. B
VOL. A
/SURR
PWR SW/IJO
RLY
+B
Q906, D918 Regulator
PT901
Q904 Relay drive
RL901
D917
Q905, D916 Regulator
D915
Q903, D991 Regulator
D907, 908
D911, 912
D913
AC2
AC1
CT
Q901, 908, D905 Regulator
D901-904
Q902, D906 Regulator
JK203(1/2)
AC
CT
AC

# ■ Power Supply with Tuner ST-CH510

**This unit ST-CH510 is designed to operate on power supplied from the Amplifier SE-CH510.**
**When operating the unit ST-CH510 alone for testing and servicing, without having power supplied from the Amplifier SE-CH510, use the following method.**

## Power Supply to Main Circuit

1. Short the section between the test points **TP903** and **TP904** on the resistor **R951** as well as the section between the test points **TP902** (Anode side) and **TP901** (Cathode side) of the diode **D919**.
2. Apply 11 V AC power to the section between the point AC 11 V (**AC**) of the jumper **J224** and the point CT (**CT**) of the jumper **J225** as well as the section between the point AC 11 V (**AC**) of the jumper **J226** and the point CT (**CT**) of the jumper **J225**. (10 V AC power can be also applied when using power supply tool.) This unit comes to stand-by mode.
3. Short the section between the jumper **J59** and the point D.GND of the jumper **J255** for a moment. The main circuit comes to power ON mode. (Whenever this operation is performed, power, ON/OFF mode is repeated.)

## Power Supply to Tuner Circuit

1. Apply power source to the main circuit.
2. Connect the DC +15 V terminal to the jumper **J302**, and the GND terminal to both the point T.GND of the jumper **J208** and the point CT (**CT**) of the jumper **J225** using the DC power supply tool.

**Note:** If the GND terminal of the DC power supply tool is connected to the point CT (**CT**) of the jumper **J225**, an error occurs in measurement values for voltage and waveform.

## To Check Signals

Connect the oscilloscope or the speaker with the built-in amplifier to the section between LINE OUT (R-ch) of the capacitor **C706** and the test point **TP904** of the resistor **R951** as well as the section between LINE OUT (L-ch) of the capacitor **C705** and the test point **TP904** of the resistor **R951** and check if the signals are outputting from this unit.

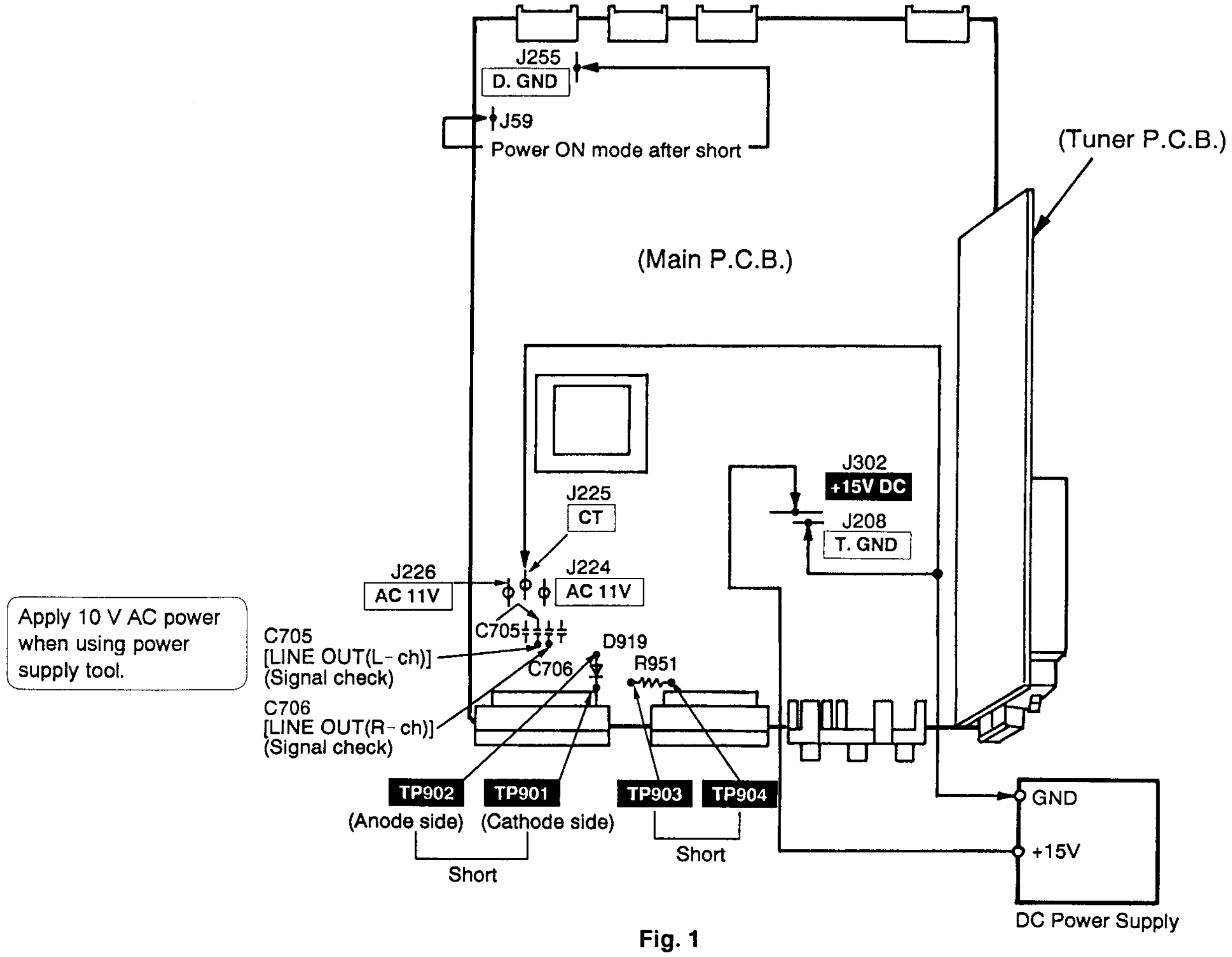


Fig. 1

**Note:** This unit is not required to adjust.

# ■ Function of IC Terminals

- **IC801 (M38173M6277F)**

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | KEY3 | I | Power ON/OFF operation detect signal input |
| 2 | KEY2 | I | Operation key signal input |
| 3 | KEY1 | I | Operation key signal input |
| 4 | /SD | I | SD signal input for tuner |
| 5 | /STEREO | I | STEREO signal input for tuner |
| 6 | STB | O | Strobe signal output to IC201 and operation key |
| 7 | CE1 | O | Chip enable signal output to IC102 |
| 8 | CL1 | O | Clock signal output to IC301, IC201 and IC102 |
| 9 | DATA | O | Data signal output to IC301, IC201 and IC102 |
| 10 | DATA IN | I | Data signal input from IC102 |
| 11 | VR ATT1 | O | Attenuator signal (-10 dB) output for main volume |
| 12 | MUTE | O | Main muting signal output |
| 13 | PASS1 | O | Output the ON/OFF control signal for Q606 |
| 14 | /PASS2 | O | Output the ON/OFF control signal for Q605 |
| 15 | /B.DATA IN | I | Bus data input |
| 16 | /B.CLK IN | I | Bus clock input |
| 17 | /B.DATA OUT | O | Bus data output |
| 18 | /B.CLK OUT | O | Bus clock output |
| 19 | SURR & CHECK | O | POWER ON mode:<br>Output for SPACE "ON"/ECHO "ON"<br>POWER OFF mode:<br>Demultiplier output for clock control |
| 20 | POWER | I/O | Power control output<br>(During POWER ON: "H") |
| 21 | VR ATT2 | O | Attenuator signal (-10 dB) output for main volume |
| 22 | SELECTOR TUNER | O | Selector TUNER output |
| 23 | VR JOG B | I | Rotary encoder input for main volume |
| 24 | VR JOG A | | |
| 25 | REMOCON | I | Input for remote control |
| 26 | AC IN | I | AC power source input terminal for an electricity failure |
| 27 | /RESET | I | Reset input terminal |
| 28 | XCIN | — | Connect to GND |
| 29 | XCOUT | — | Unused, open |
| 30 | XIN | I | Connected to a oscillator for system clock X801 (4.194304 MHz) |
| 31 | XOUT | O | |
| 32 | VSS | — | Connected to GND |

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 33 | /MIC | I | Input for MIC detection (Connection: "L") |
| 34 | CR TIMER | I/O | CR timer (Back up signal detect for clock) |
| 35 | ECHO | O | Output for ECHO "ON" |
| 36 | D1 | O | Output for echo level set |
| 37 | D2 | | |
| 38 | LED SET | O | LED drive signal (SET) |
| 39 | LED UD & CS2 | O | LED drive signal (TUNING) |
| | | I | Input for chip select signal |
| 40 | LED RL & CS1 | O | LED drive signal (PRESET or SELECT) |
| | | I | Input for chip select signal |
| 41 ~ 44 | P28 ~ P25 | O | Segment output for FL display and chip select signal output |
| 45 ~ 54 | P24 ~ P15 | O | Segment output for FL display |
| 55 | 1G | O | Grid output for FL display |
| 56 | 2G | | |
| 57 ~ 70 | P14 ~ P1 | O | Segment output for FL display |
| 71 | 8G | O | Grid output for FL display |
| 72 | 7G | | |
| 73 | VCC | I | Supplied (+5V) |
| 74 | VEE | I | Supplied power to FL display for pulling down |
| 75 | AVSS | — | Connected to GND |
| 76 | VREF | — | Standard voltage for A/D convertor (Connected to VCC) |
| 77 ~ 80 | /6G ~ /3G | O | Grid output for FL display |

| Ref. No. |
|---|
| |
| |
| |
| IC101 |
| IC102 |
| IC201 |
| IC251 |
| IC301 |
| IC601 |
| IC801 |
| IC802 |
| |
| |
| |
| Q101, 102 |
| Q103, 104 |
| Q106 |
| Q107, 108 |
| Q191-193 |
| Q401, 402 |
| Q405 |
| Q406 |
| Q407 |
| Q408 |
| Q409 |
| Q431, 432 |
| Q433 |
| Q441, 442 |
| Q601-604 |
| Q605, 606 |
| Q801-804 |
| Q805 |
| Q811 |
| Q812 |
| Q814 |
| Q815-817 |
| Q901 |
| Q902 |
| Q903 |
| Q904 |
| Q905 |
| Q906 |
| Q908 |
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## ■ Function of IC Terminals

### ● IC801 (M38173M6277F)

| Pin No. | Terminal Name | I/O | Function |
|---|---|---|---|
| 1 | KEY3 | I | Power ON/OFF operation detect signal input |
| 2 | KEY2 | I | Operation key signal input |
| 3 | KEY1 | I | Operation key signal input |
| 4 | /SD | I | SD signal input for tuner |
| 5 | /STEREO | I | STEREO signal input for tuner |
| 6 | STB | O | Strobe signal output to IC201 and operation key |
| 7 | CE1 | O | Chip enable signal output to IC102 |
| 8 | CL1 | O | Clock signal output to IC301, IC201 and IC102 |
| 9 | DATA | O | Data signal output to IC301, IC201 and IC102 |
| 10 | DATA IN | I | Data signal input from IC102 |
| 11 | VR ATT1 | O | Attenuator signal (-10 dB) output for main volume |
| 12 | MUTE | O | Main muting signal output |
| 13 | PASS1 | O | Output the ON/OFF control signal for Q606 |
| 14 | /PASS2 | O | Output the ON/OFF control signal for Q605 |
| 15 | /B.DATA IN | I | Bus data input |
| 16 | /B.CLK IN | I | Bus clock input |
| 17 | /B.DATA OUT | O | Bus data output |
| 18 | /B.CLK OUT | O | Bus clock output |
| 19 | SURR & CHECK | O | POWER ON mode:<br>Output for SPACE "ON"/ECHO "ON"<br>POWER OFF mode:<br>Demultiplier output for clock control |
| 20 | POWER | I/O | Power control output<br>(During POWER ON: "H") |
| 21 | VR ATT2 | O | Attenuator signal (-10 dB) output for main volume |
| 22 | SELECTOR TUNER | O | Selector TUNER output |
| 23 | VR JOG B | I | Rotary encoder input for main volume |
| 24 | VR JOG A | | |
| 25 | REMOCON | I | Input for remote control |
| 26 | AC IN | I | AC power source input terminal for an electricity failure |
| 27 | /RESET | I | Reset input terminal |
| 28 | XCIN | — | Connect to GND |
| 29 | XCOUT | — | Unused, open |
| 30 | XIN | I | Connected to a oscillator for system clock X801 (4.194304 MHz) |
| 31 | XOUT | O | |
| 32 | VSS | — | Connected to GND |
| 33 | /MIC | I | Input for MIC detection (Connection: "L") |
| 34 | CR TIMER | I/O | CR timer (Back up signal detect for clock) |
| 35 | ECHO | O | Output for ECHO "ON" |
| 36 | D1 | O | Output for echo level set |
| 37 | D2 | | |
| 38 | LED SET | O | LED drive signal (SET) |
| 39 | LED UD & CS2 | O | LED drive signal (TUNING) |
| | | I | Input for chip select signal |
| 40 | LED RL & CS1 | O | LED drive signal (PRESET or SELECT) |
| | | I | Input for chip select signal |
| 41<br>≀<br>44 | P28<br>≀<br>P25 | O | Segment output for FL display and chip select signal output |
| 45<br>≀<br>54 | P24<br>≀<br>P15 | O | Segment output for FL display |
| 55 | 1G | O | Grid output for FL display |
| 56 | 2G | | |
| 57<br>≀<br>70 | P14<br>≀<br>P1 | O | Segment output for FL display |
| 71 | 8G | O | Grid output for FL display |
| 72 | 7G | | |
| 73 | VCC | I | Supplied (+5V) |
| 74 | VEE | I | Supplied power to FL display for pulling down |
| 75 | AVSS | — | Connected to GND |
| 76 | VREF | — | Standard voltage for A/D convertor (Connected to VCC) |
| 77<br>≀<br>80 | /6G<br>≀<br>/3G | O | Grid output for FL display |

## ■ Replacement Parts List

**Notes:** •Important safety notice:
Components identified by △ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
•The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
•The "(SF)" mark denotes the standard part.

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | INTEGRATED CIRCUIT(S) | |
| | | | |
| IC101 | LA1832MH-TEL | I. C, FM/AM IF AMP. | |
| IC102 | LC7218M-TE-L | I. C, PLL FREQ. SYNTHESIZER | |
| IC201 | NJU7313AMT2 | I. C, INPUT SELECTOR | |
| IC251 | AN6558SFE2 | I. C, PHONO EQ AMP | (E, EG) |
| IC301 | M62408FP | I. C, DIGITAL SOUND CONT. | |
| IC601 | XRA4558FT1 | I. C, BUFFER AMP. | |
| IC801 | M38173M6277F | I. C, SYSTEM CONT. /FL DRIVE | |
| IC802 | LA5608M-TE-L | I. C, BUS LINE/HALF/RESET | |
| | | | |
| | | TRANSISTOR(S) | |
| | | | |
| Q101, 102 | 2SC2787L | TRANSISTOR | |
| Q103, 104 | 2SC2785FE | TRANSISTOR | |
| Q106 | UN411FTA | TRANSISTOR | |
| Q107, 108 | 2SC3311ARSTA | TRANSISTOR | |
| Q191-193 | 2SC3311ARSTA | TRANSISTOR | (E, GC) |
| Q401, 402 | 2SD2144S | TRANSISTOR | |
| Q405 | UN4115 | TRANSISTOR | |
| Q406 | 2SD2144S | TRANSISTOR | |
| Q407 | UN4111 | TRANSISTOR | |
| Q408 | 2SC3311AIQST | TRANSISTOR | |
| Q409 | UN4115 | TRANSISTOR | |
| Q431, 432 | 2SC3311AIQST | TRANSISTOR | |
| Q433 | UN4115 | TRANSISTOR | |
| Q441, 442 | 2SJ164PQRTA | TRANSISTOR | |
| Q601-604 | 2SJ164PQRTA | TRANSISTOR | |
| Q605, 606 | UN4115 | TRANSISTOR | |
| Q801-804 | UN4111 | TRANSISTOR | |
| Q805 | UN421FTA | TRANSISTOR | |
| Q811 | 2SC3311AIQST | TRANSISTOR | |
| Q812 | UN411FTA | TRANSISTOR | |
| Q814 | 2SD2144S | TRANSISTOR | |
| Q815-817 | UN421FTA | TRANSISTOR | |
| Q901 | 2SC3940AQSTA | TRANSISTOR | ⚠ |
| Q902 | 2SB1417PQTA | TRANSISTOR | ⚠ |
| Q903 | 2SC3940AQSTA | TRANSISTOR | ⚠ |
| Q904 | 2SD2144S | TRANSISTOR | |
| Q905 | 2SB621A-R | TRANSISTOR | ⚠ |
| Q906 | 2SC3940AQSTA | TRANSISTOR | ⚠ |
| Q908 | 2SC3940AQSTA | TRANSISTOR | ⚠ |
| | | | |
| | | DIODE(S) | |
| | | | |
| D101 | MA4051MTA | DIODE | ⚠ |
| D102 | MA165 | DIODE | |
| D401, 402 | MA165 | DIODE | |
| D801 | 1SS291TA | DIODE | |
| D802 | MA165 | DIODE | |
| D803 | 1SS291TA | DIODE | |
| D804-806 | MA165 | DIODE | |
| D807 | SPR-305MDTF | LED | |
| D810 | MA165 | DIODE | |
| D811 | MA165 | DIODE | (E, GC) |
| D812 | MA165 | DIODE | (EG) |
| D814 | MA165 | DIODE | (GC) |
| D817-820 | SLR-305MC | LED | |
| D821 | SLR-305VC | LED | |
| D831-833 | MA165 | DIODE | |
| D901-904 | RL1N4003N02 | DIODE | ⚠ |
| D905, 906 | MA4082LTA | DIODE | ⚠ |
| D907, 908 | RL1N4003N02 | DIODE | ⚠ |
| D910 | MA4120 | DIODE | |
| D911, 912 | MA185TA | DIODE | ⚠ |
| D913 | MA4051-L | DIODE | ⚠ |
| D915 | RL1N4003N02 | DIODE | ⚠ |
| D916 | MA4240H | DIODE | ⚠ |
| D917 | MA4039MTA | DIODE | ⚠ |
| D918 | MA4082MTA | DIODE | ⚠ |
| D919, 920 | MA165 | DIODE | |
| D991 | MA4062-H | DIODE | ⚠ |
| | | | |
| | | COMPONENT COMBINATION(S) | |
| | | | |
| Z101 | RLA2Z002M-T | COMPONENT COMBINATION | (EG) |
| Z102 | RLI2Z006M-T | COMPONENT COMBINATION | |
| Z120 | RAL0006 | FM FRONT END | (E, GC) |
| Z120 | RAL0019 | FM FRONT END | (EG) |
| Z191 | RLA6Z005M-T | COMPONENT COMBINATION | (E, GC) |
| Z801 | RCDHC-278N | REMOTE SENSOR | |
| | | | |
| | | COIL(S) | |
| | | | |
| L101 | ELESNR68MA | COIL | |
| L103 | ELEXTR47MA9 | COIL | |
| L105, 106 | ELELN822KL | COIL | |
| L151 | SLM1B10M-1M | COIL | (EG) |
| L191 | ELESNR68MA | COIL | |
| L702 | ELEXT101KA9 | COIL | |
| L801 | RLQA100JT-Y | COIL | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
|  |  | FILTER(S) |  |
| CF201, 202 | RLFFETWND01M | CERAMIC FILTER | (E, GC) |
| CF201, 202 | RLFFETMGD01L | CERAMIC FILTER | (EG) |
|  |  | OSCILLATOR(S) |  |
| X101 | RSXZ456KM07M | OSCILLATOR(456KHz) |  |
| X102 | RLFDGTD01I | OSCILLATOR(10. 65MHz) |  |
| X103 | RSXC7M20S04T | OSCILLATOR(7. 2MHz) |  |
| X801 | RSXA4M19S03 | OSCILLATOR(4. 19MHz) |  |
|  |  | DISPLAY TUBE |  |
| FL801 | RSL0183-F | DISPLAY TUBE |  |
|  |  | SWITCH(ES) |  |
| S801 | EVQ21405R | SW, SELECTOR |  |
| S802 | EVQ21405R | SW, KARAOKE |  |
| S804 | EVQ21405R | SW, V. BASS |  |
| S805 | EVQ21405R | SW, EQ SPACE |  |
| S806 | EVQ21405R | SW, FLAT |  |
| S807 | EVQ21405R | SW, AUTO PRESET |  |
| S808 | EVQ21405R | SW, FM |  |
| S809 | EVQ21405R | SW, AM(LW/ME) |  |
| S810 | EVQ21405R | SW, TUNING |  |
| S811 | EVQ21405R | SW, TUNING |  |
| S812 | EVQ21405R | SW, SELECT |  |
| S813 | EVQ21405R | SW, SELECT |  |
| S814 | EVQ21405R | SW, SET |  |
| S815 | EVQ21405R | SW, CLOCK/TIMER |  |
| S816 | EVQ21405R | SW, REC |  |
| S817 | EVQ21405R | SW, PLAY |  |
|  |  | CONNECTOR(S) |  |
| CN801-804 | RJT003K008-1 | CONNECTOR(8P) |  |
| CN201A | RJT057W007-1 | CONNECTOR(7P) |  |
| CN202A | RJT057W007-1 | CONNECTOR(7P) |  |
| CN101B | RJU057W007 | SOCKET(7P) |  |
| CN102B | RJU057W007 | SOCKET(7P) |  |
| CP801-804 | RJU003K008M1 | SOCKET(8P) |  |
|  |  | EARTH TERMINAL(S) |  |
| E201 | SNE1004-2 | GND PLATE |  |
| E901 | SNE1004-2 | GND PLATE |  |
|  |  | TRANSFORMER |  |
| PT901 | RTP1I4G005-M | POWER TRANSFORMER | ⚠ |
|  |  | RELAY |  |
| RL901 | RSY0017M-0 | RELAY | ⚠ |
|  |  | JACK(S) |  |
| JK101 | RJH5210M | EXT ANT |  |
| JK201 | SJF3068-7N | PHONO |  |
| JK202 | SJF3069-5N | DAT/DCC |  |
| JK203 | RJT065K15 | CONNECTOR(15P) |  |
| JK204 | RJT065K20 | CONNECTOR(20P) |  |

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| | | |
| | | RESISTORS |
| | | |
| R103 | ERDS2TJ271 | 1/4W 270 (E, GC) |
| R103 | ERDS2TJ330T | 1/4W 33 (EG) |
| R104 | ERDS2TJ822 | 1/4W 8.2K (E, GC) |
| R104 | ERDS2TJ103 | 1/4W 10K (EG) |
| R105 | ERDS2TJ471 | 1/4W 470 |
| R106 | ERDS2TJ474 | 1/4W 470K |
| R107 | ERDS2TJ331 | 1/4W 330 |
| R108 | ERDS2TJ474 | 1/4W 470K |
| R109 | ERDS2TJ331 | 1/4W 330 |
| R110 | ERDS2TJ102 | 1/4W 1K |
| R112 | ERDS2TJ104 | 1/4W 100K |
| R113 | ERDS2TJ103 | 1/4W 10K |
| R114 | ERDS2TJ562 | 1/4W 5.6K |
| R115 | ERDS2TJ561 | 1/4W 560 |
| R116 | ERDS2TJ102 | 1/4W 1K |
| R117 | ERDS2TJ273 | 1/4W 27K (E, GC) |
| R117 | ERDS2TJ823T | 1/4W 82K (EG) |
| R118 | ERDS2TJ562 | 1/4W 5.6K |
| R119 | ERDS2TJ682T | 1/4W 6.8K (E, GC) |
| R119 | ERDS2TJ822T | 1/4W 8.2K (EG) |
| R120 | ERDS2TJ473 | 1/4W 47K |
| R121 | ERDS2TJ332 | 1/4W 3.3K |
| R122 | ERDS2TJ272T | 1/4W 2.7K |
| R124 | ERDS2TJ271 | 1/4W 270 |
| R125, 126 | ERDS2TJ152 | 1/4W 1.5K |
| R127 | ERDS2TJ103 | 1/4W 10K |
| R128 | ERDS2TJ820 | 1/4W 82 |
| R129 | ERDS2TJ473 | 1/4W 47K |
| R130 | ERDS2TJ103 | 1/4W 10K |
| R132 | ERDS2TJ103 | 1/4W 10K |
| R133-137 | ERDS2TJ102 | 1/4W 1K |
| R138 | ERDS2TJ103 | 1/4W 10K |
| R139, 140 | ERDS2TJ272T | 1/4W 2.7K |
| R141, 142 | ERDS2TJ102 | 1/4W 1K |
| R143, 144 | ERDS2TJ222 | 1/4W 2.2K |
| R145, 146 | ERDS2TJ102 | 1/4W 1K (E, GC) |
| R145, 146 | ERDS2TJ821T | 1/4W 820 (EG) |
| R147, 148 | ERDS2TJ474 | 1/4W 470K |
| R149 | ERDS2TJ680T | 1/4W 68 |
| R171, 172 | ERDS2TJ102 | 1/4W 1K |
| R173 | ERDS2TJ471 | 1/4W 470 |
| R175 | ERDS2TJ102 | 1/4W 1K |
| R176 | ERDS2TJ391 | 1/4W 390 |
| R191 | ERDS2TJ103 | 1/4W 10K (E, GC) |
| R192 | ERDS2TJ122 | 1/4W 1.2K (E, GC) |
| R193 | ERDS2TJ182 | 1/4W 1.8K (E, GC) |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| R194 | ERDS2TJ122 | 1/4W 1.2K (E, GC) |
| R195 | ERDS2TJ222 | 1/4W 2.2K (E, GC) |
| R201-203 | ERDS2TJ222 | 1/4W 2.2K |
| R205, 206 | ERDS2TJ103 | 1/4W 10K |
| R207, 208 | ERDS2TJ473 | 1/4W 47K |
| R209, 210 | ERDS2TJ122 | 1/4W 1.2K |
| R211, 212 | ERDS2TJ224T | 1/4W 220K |
| R213, 214 | ERDS2TJ102 | 1/4W 1K (E, EG) |
| R213, 214 | ERDS2TJ562T | 1/4W 5.6K (GC) |
| R215, 216 | ERDS2TJ473 | 1/4W 47K (E, EG) |
| R215, 216 | ERDS2TJ103 | 1/4W 10K (GC) |
| R217, 218 | ERDS2TJ104 | 1/4W 100K |
| R221, 222 | ERDS2TJ102 | 1/4W 1K |
| R223, 224 | ERDS2TJ682T | 1/4W 6.8K |
| R227, 228 | ERDS2TJ471 | 1/4W 470 |
| R229 | ERDS2TJ102 | 1/4W 1K |
| R255, 256 | ERDS2TJ331 | 1/4W 330 (E, EG) |
| R257, 258 | ERDS2TJ221 | 1/4W 220 (E, EG) |
| R259, 260 | ERDS2TJ184T | 1/4W 180K (E, EG) |
| R261, 262 | ERDS2TJ123 | 1/4W 12K (E, EG) |
| R263, 264 | ERDS2TJ680T | 1/4W 68 (E, EG) |
| R265, 266 | ERDS2TJ104 | 1/4W 100K (E, EG) |
| R267, 268 | ERDS2TJ272T | 1/4W 2.7K (E, EG) |
| R269, 270 | ERD25FJ470 | 1/4W 47 ⚠(E, EG) |
| R301, 302 | ERDS2TJ223 | 1/4W 22K |
| R303, 304 | ERDS2TJ123 | 1/4W 12K |
| R305, 306 | ERDS2TJ153 | 1/4W 15K |
| R307, 308 | ERDS2TJ122 | 1/4W 1.2K |
| R309, 310 | ERDS2TJ102 | 1/4W 1K |
| R311, 312 | ERDS2TJ104 | 1/4W 100K |
| R313 | ERDS2TJ824 | 1/4W 820K |
| R314 | ERDS2TJ332 | 1/4W 3.3K |
| R315, 316 | ERDS2TJ103 | 1/4W 10K |
| R317 | ERDS2TJ183T | 1/4W 18K |
| R318 | ERDS2TJ103 | 1/4W 10K |
| R319, 320 | ERDS2TJ105T | 1/4W 1M |
| R321 | ERDS2TJ561 | 1/4W 560 |
| R322-324 | ERDS2TJ222 | 1/4W 2.2K |
| R391, 392 | ERDS2TJ224T | 1/4W 220K |
| R393, 394 | ERDS2TJ223 | 1/4W 22K |
| R399 | ERDS2TJ272T | 1/4W 2.7K |
| R401, 402 | ERDS2TJ102 | 1/4W 1K |
| R403, 404 | ERDS2TJ122 | 1/4W 1.2K |
| R405, 406 | ERDS2TJ104 | 1/4W 100K |
| R407, 408 | ERDS2TJ102 | 1/4W 1K |
| R409 | ERDS2TJ105T | 1/4W 1M |
| R410 | ERDS2TJ222 | 1/4W 2.2K |
| R411, 412 | ERDS2TJ332 | 1/4W 3.3K |
| R415-417 | ERDS2TJ102 | 1/4W 1K |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| R418 | ERDS2TJ334 | 1/4W 330K |
| R419 | ERDS2TJ472 | 1/4W 4.7K |
| R420, 421 | ERDS2TJ473 | 1/4W 47K |
| R431, 432 | ERDS2TJ471 | 1/4W 470 |
| R433, 434 | ERDS2TJ104 | 1/4W 100K |
| R435, 436 | ERDS2TJ102 | 1/4W 1K |
| R437 | ERDS2TJ472 | 1/4W 4.7K |
| R438, 439 | ERDS2TJ105T | 1/4W 1M |
| R441, 442 | ERDS2TJ102 | 1/4W 1K |
| R443, 444 | ERDS2TJ473 | 1/4W 47K |
| R447 | ERDS2TJ102 | 1/4W 1K |
| R448 | ERDS2TJ104 | 1/4W 100K |
| R451 | ERDS2TJ103 | 1/4W 10K |
| R601, 602 | ERDS2TJ153 | 1/4W 15K |
| R603, 604 | ERDS2TJ333 | 1/4W 33K |
| R605, 606 | ERDS2TJ152 | 1/4W 1.5K |
| R607, 608 | ERDS2TJ392T | 1/4W 3.9K |
| R609, 610 | ERDS2TJ104 | 1/4W 100K |
| R611, 612 | ERDS2TJ103 | 1/4W 10K |
| R613, 614 | ERDS2TJ104 | 1/4W 100K |
| R615-618 | ERDS2TJ105T | 1/4W 1M |
| R701, 702 | ERDS2TJ102 | 1/4W 1K |
| R704 | ERDS2TJ471 | 1/4W 470 |
| R705, 706 | ERDS2TJ102 | 1/4W 1K |
| R801-804 | ERDS2TJ104 | 1/4W 100K |
| R811-813 | ERDS2TJ103 | 1/4W 10K |
| R814 | ERDS2TJ821 | 1/4W 820 |
| R815 | ERDS2TJ102 | 1/4W 1K |
| R816 | ERDS2TJ122 | 1/4W 1.2K |
| R817 | ERDS2TJ152 | 1/4W 1.5K |
| R818 | ERDS2TJ182 | 1/4W 1.8K |
| R819 | ERDS2TJ222 | 1/4W 2.2K |
| R820 | ERDS2TJ821 | 1/4W 820 |
| R821 | ERDS2TJ102 | 1/4W 1K |
| R822 | ERDS2TJ122 | 1/4W 1.2K |
| R823 | ERDS2TJ152 | 1/4W 1.5K |
| R824 | ERDS2TJ182 | 1/4W 1.8K |
| R825 | ERDS2TJ222 | 1/4W 2.2K |
| R826 | ERDS2TJ332 | 1/4W 3.3K |
| R827 | ERDS2TJ472 | 1/4W 4.7K |
| R828 | ERDS2TJ682T | 1/4W 6.8K |
| R832-840 | ERDS2TJ104 | 1/4W 100K |
| R841 | ERDS2TJ224T | 1/4W 220K |
| R842, 843 | ERDS2TJ393 | 1/4W 39K |
| R844 | ERDS2TJ103 | 1/4W 10K |
| R845-847 | ERDS2TJ222 | 1/4W 2.2K |
| R848 | ERDS2TJ102 | 1/4W 1K |
| R849 | ERDS2TJ392T | 1/4W 3.9K |
| R850, 851 | ERDS2TJ222 | 1/4W 2.2K |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| R852 | ERDS2TJ392T | 1/4W 3. 9K |
| R853 | ERDS2TJ103 | 1/4W 10K |
| R855 | ERDS2TJ392T | 1/4W 3. 9K |
| R856 | ERDS2TJ103 | 1/4W 10K |
| R857 | ERDS2TJ331 | 1/4W 330 |
| R858, 859 | ERDS2TJ102 | 1/4W 1K |
| R860, 861 | ERDS2TJ223 | 1/4W 22K |
| R864 | ERDS2TJ221 | 1/4W 220 |
| R865 | ERDS2TJ104 | 1/4W 100K |
| R866 | ERDS2TJ470 | 1/4W 47 |
| R867 | ERDS2TJ223 | 1/4W 22K |
| R868, 869 | ERDS2TJ473 | 1/4W 47K |
| R870 | ERDS2TJ272T | 1/4W 2. 7K |
| R871 | ERDS2TJ820 | 1/4W 82 |
| R872 | ERDS2EJ121 | 1/4W 120 |
| R875, 876 | ERDS2TJ471 | 1/4W 470 |
| R877, 878 | ERDS2TJ271 | 1/4W 270 |
| R880 | ERDS2TJ221 | 1/4W 220 |
| R882 | ERDS2TJ391 | 1/4W 390 |
| R901, 902 | ERD2FCVJ4R7T | 1/4W 4. 7 ⚠ |
| R903, 904 | ERDS2TJ102 | 1/4W 1K |
| R905 | ERG1SJ220E | 1W 22 |
| R906 | ERG1SJ330E | 1W 33 |
| R909 | ERDS2TJ332 | 1/4W 3. 3K |
| R910 | ERG1SJ220E | 1W 22 |
| R912, 913 | ERDS2TJ332 | 1/4W 3. 3K |
| R914 | ERDS2TJ103 | 1/4W 10K |
| R915, 916 | ERDS2TJ393 | 1/4W 39K |
| R917 | ERD25FVJ4R7T | 1/4W 4. 7 ⚠ |
| R918 | ERDS2TJ472 | 1/4W 4. 7K |
| R921, 922 | ERDS2TJ151 | 1/4W 150 |
| R923 | ERDS2TJ152 | 1/4W 1. 5K |
| R924 | ERDS2TJ331 | 1/4W 330 |
| R931 | ERDS2TJ2R2T | 1/4W 2. 2 |
| R932 | ERDS2TJ101 | 1/4W 100 |
| R933 | ERDS2TJ2R2T | 1/4W 2. 2 |
| R951, 952 | ERDS2TJ100 | 1/4W 10 |
| | | |
| | | CAPACITORS |
| | | |
| C101 | ECBT1C103NS5 | 16V 0. 01U |
| C103 | ECBT1C103NS5 | 16V 0. 01U |
| C104, 105 | ECBT1H102KB5 | 50V 1000P |
| C106 | ECBT1C103NS5 | 16V 0. 01U |
| C107 | ECBT1H473ZF5 | 50V 0. 047U |
| C108 | ECBT1H100JC5 | 50V 10P (E, GC) |
| C108 | ECBT1H8R2KC5 | 50V 8. 2P (EG) |
| C109, 110 | ECBT1C103NS5 | 16V 0. 01U |
| C111 | ECEA1EKA4R7B | 25V 4. 7U |
| C112 | ECBT1C103NS5 | 16V 0. 01U |
| C113 | ECBT1H102KB5 | 50V 1000P |
| C114 | ECEA1HKA3R3B | 50V 3. 3U |

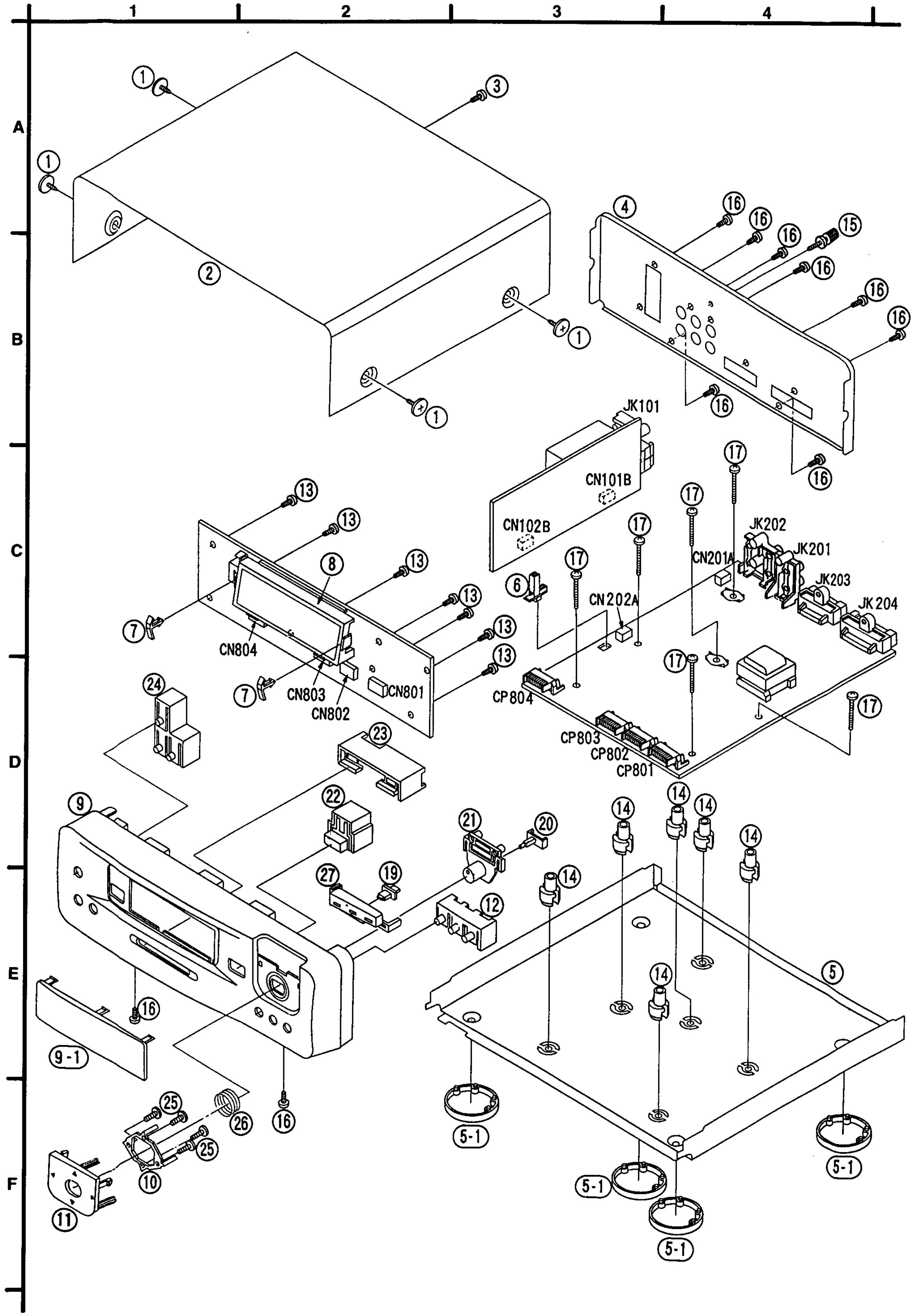
| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| C115 | ECEA1EKA4R7B | 25V 4. 7U |
| C116 | ECBT1C822KS5 | 16V 8200P |
| C117 | ECQB1H102JF3 | 50V 1000P (E, GC) |
| C117 | ECQB1H561JF3 | 50V 560P (EG) |
| C118, 119 | ECFR1C103KR | 16V 0. 01U |
| C120, 121 | ECEA1HKA010B | 50V 1U |
| C122 | ECEA1HKA2R2B | 50V 2. 2U |
| C123 | ECEA1HKA010B | 50V 1U |
| C124 | ECBT1H102KB5 | 50V 1000P |
| C125 | ECBT1H150JC5 | 50V 15P |
| C126 | ECBT1H473ZF5 | 50V 0. 047U |
| C127 | ECEA1CKA220B | 16V 22U |
| C128 | ECBT1H102KB5 | 50V 1000P |
| C129, 130 | ECEA0JKA101B | 6. 3V 100U |
| C132 | ECBT1H102KB5 | 50V 1000P |
| C133, 134 | ECBT1H270JU5 | 50V 27P |
| C135, 136 | ECBT1C103KS5 | 16V 0. 01U |
| C137, 138 | ECBT1H561KB5 | 50V 560P |
| C139, 140 | ECBT1C562KR5 | 16V 5600P (E, GC) |
| C139, 140 | ECBT1C682KR5 | 16V 6800P (EG) |
| C141-144 | ECEA1HKA010B | 50V 1U |
| C145 | ECBT1H220JC5 | 50V 22P |
| C148 | ECBT1C103NS5 | 16V 0. 01U |
| C149 | ECBT1H104ZF5 | 50V 0. 1U |
| C171, 172 | ECBT1H102KB5 | 50V 1000P |
| C173 | ECEA1CKA220B | 16V 22U |
| C174 | ECEA1CKA100B | 16V 10U |
| C181 | ECBT1H471KB5 | 50V 470P (EG) |
| C196 | ECBT1H102KB5 | 50V 1000P |
| C201, 202 | ECBT1H104ZF5 | 50V 0. 1U |
| C203-205 | ECBT1H470J5 | 50V 47P |
| C207, 208 | ECBT1H151KB5 | 50V 150P (E, EG) |
| C209, 210 | ECBT1H180J5 | 50V 18P (E, EG) |
| C209, 210 | ECBT1H101KB5 | 50V 100P (GC) |
| C211-214 | ECBT1H101KB5 | 50V 100P |
| C251, 252 | ECBT1H102KB5 | 50V 1000P (E, EG) |
| C253, 254 | ECEA1AKA330B | 10V 33U (E, EG) |
| C255, 256 | ECBT0J223MS5 | 6. 3V 0. 022U (E, EG) |
| C257, 258 | ECBT1C682KR5 | 16V 6800P (E, EG) |
| C259, 260 | ECEA1CKA100B | 16V 10U (E, EG) |
| C261, 262 | ECBT1E103ZF | 25V 0. 01U (E, EG) |
| C301, 302 | ECEA1CKA100B | 16V 10U |
| C303, 304 | ECBT1H820KB5 | 50V 82P |
| C305, 306 | ECBT1H102KB5 | 50V 1000P |
| C307-310 | ECEA1CKA100B | 16V 10U |
| C311, 312 | ECBT1H101KB5 | 50V 100P |
| C313, 314 | ECEA1HKAR15B | 50V 0. 15U |
| C315-318 | ECEA1CKA100B | 16V 10U |
| C319, 320 | ECEA1HKA3R3B | 50V 3. 3U |
| C321, 322 | ECBT1H271KB5 | 50V 270P |
| C323, 324 | ECBT1H102KB5 | 50V 1000P |
| C325, 326 | ECEA1AKA101B | 10V 100U |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| C327-330 | ECEA1CKA100B | 16V 10U |
| C333 | ECFR1E823KR | 25V 0. 082U |
| C334 | ECFR1E472KR | 25V 4700P |
| C335 | ECEA1CN100SB | 16V 10U |
| C336 | ECBT0J223MS5 | 6. 3V 0. 022U |
| C337 | ECEA1CKA100B | 16V 10U |
| C338 | ECEA1AKA101B | 10V 100U |
| C339 | ECEA1EKA4R7B | 25V 4. 7U |
| C351, 352 | ECQV1H224JM3 | 50V 0. 22U |
| C353, 354 | ECQV1H154JM3 | 50V 0. 15U |
| C355, 356 | ECEA1HKAR22B | 50V 0. 22U |
| C357, 358 | ECFR1E223KR | 25V 0. 022U |
| C359, 360 | ECFR1E273KR | 25V 0. 027U |
| C361-364 | ECBT1C562KR5 | 16V 5600P |
| C365, 366 | ECBT1H561KB5 | 50V 560P |
| C375, 376 | ECQB1H123JF3 | 50V 0. 012U |
| C377, 378 | ECEA1HKA2R2B | 50V 2. 2U |
| C379-383 | ECBT1E103ZF | 25V 0. 01U |
| C384 | ECEA1CKA100B | 16V 10U |
| C385 | ECBT1E103ZF | 25V 0. 01U |
| C386, 387 | ECBT1H470J5 | 50V 47P |
| C389 | ECBT1H470J5 | 50V 47P |
| C391 | ECFR1E473KR | 25V 0. 047U |
| C392, 393 | ECEA1CKA100B | 16V 10U |
| C401 | ECEA1CKA220B | 16V 22U |
| C402 | ECBT1H102KB5 | 50V 1000P |
| C403 | ECEA1EKA4R7B | 25V 4. 7U |
| C404 | ECEA1HKA010B | 50V 1U |
| C413, 414 | ECEA1CKA100B | 16V 10U |
| C431 | ECEA1EKA4R7B | 25V 4. 7U |
| C441 | ECEA1EKA4R7B | 25V 4. 7U |
| C601, 602 | ECEA1CKA100B | 16V 10U |
| C603, 604 | ECEA1EKA4R7B | 25V 4. 7U |
| C605, 606 | ECEA1CKA100B | 16V 10U |
| C607, 608 | ECBT1C332KR5 | 16V 3300P |
| C609, 610 | ECBT1E103ZF | 25V 0. 01U |
| C701-707 | ECBT1H101KB5 | 50V 100P |
| C708 | ECBT1H102KB5 | 50V 1000P |
| C709, 710 | ECEA1CKA100B | 16V 10U |
| C712 | ECBT1H102KB5 | 50V 1000P |
| C751, 752 | ECBT1E103ZF | 25V 0. 01U |
| C753 | ECBT1H102KB5 | 50V 1000P |
| C801 | ECA0JM102B | 6. 3V 1000P |
| C802 | ECBT1H102KB5 | 50V 1000P |
| C803 | ECBT1H104ZF5 | 50V 0. 1U |
| C805 | ECEA0JKA101B | 6. 3V 100U |
| C806 | ECBT1E223ZF | 25V 0. 022U |
| C807 | ECBT1H102KB5 | 50V 1000P |
| C808, 809 | ECBT1E103ZF | 25V 0. 01U |
| C810 | ECEA1CKA100B | 16V 10U |
| C811 | ECBT1E103ZF | 25V 0. 01U |
| C812 | ECBT1H101KB5 | 50V 100P |

| Ref. No. | Part No. | Values & Remarks |
|---|---|---|
| C813, 814 | ECEA1HKA010B | 50V 1U |
| C815 | ECBT1E103ZF | 25V 0. 01U |
| C851 | ECEA1HKAR33B | 50V 0. 33U |
| C852 | ECQV1H104JM3 | 50V 0. 1U |
| C861 | ECBT1H220GC5 | 50V 22P |
| C862 | ECBT1H270JU5 | 50V 27P |
| C871 | ECEA0JKA101B | 6. 3V 100U |
| C872 | ECBT1E103ZF | 25V 0. 01U |
| C901, 902 | ECKT1H223ZF | 50V 0. 022U |
| C903 | RCE1EM471BV | 25V 470U |
| C904 | RCE1EM471BV | 25V 470U ⚠ |
| C905-907 | ECBT1E103ZF | 25V 0. 01U |
| C908 | ECEA1CKA100B | 16V 10U |
| C909 | ECBT1H104ZF5 | 50V 0. 1U |
| C910 | ECEA1CKA100B | 16V 10U |
| C911 | RCE1HM221BV | 50V 220U ⚠ |
| C912 | ECEA1VKA100B | 35V 10U |
| C913 | ECBT1E103ZF | 25V 0. 01U |
| C914 | ECEA1AKA101B | 10V 100U |
| C915 | ECBT1E103ZF | 25V 0. 01U |
| C916 | ECBT1H102KB5 | 50V 1000P |
| C920 | ECEA1VKA100B | 35V 10U |
| C921 | ECBT1E103ZF | 25V 0. 01U |
| C951 | RCE1EM471BV | 25V 470U ⚠ |
| C952 | ECBT1H104ZF5 | 50V 0. 1U |
| C953 | ECBT1H102KB5 | 50V 1000P |
| C991, 992 | ECEA1AKA470B | 10V 47U (E, EB) |
| C993 | ECEA1CKA100B | 16V 10U |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | | |
| | | CABINET PARTS LIST | |
| | | | |
| 1 | RHD30007 | SCREW | |
| 2 | RKM0266-K | CABINET | |
| 3 | XTB3+8JFZ | SCREW | |
| 4 | RGR0197A-A1 | REAR PANEL | (E) |
| 4 | RGR0197A-H | REAR PANEL | (EG) |
| 4 | RGR0197A-B | REAR PANEL | (GC) |
| 5 | RFKJSCH404EK | BOTTOM BOAD ASS' Y | |
| 5-1 | RKA0011-3 | FOOT | |
| 6 | RMN0203 | HOLDER | |
| 7 | RMN0195 | FL SPACER | |
| 8 | RMN0284 | FL HOLDER | |
| 9 | RFKGTCH510EK | FRONT PANEL ASS' Y | |
| 9-1 | RKW0349-V | FL PANEL | |
| 10 | RGL0240-Q | PANEL LIGHT | |
| 11 | RGU1089-K | BUTTON, MULTI CONTROL | |
| 12 | RGU1099-K | BUTTON, EQ SPACE | |
| 13 | XTBS26+8J | SCREW | |
| 14 | SHE185-2 | P. C. B. SPACER | |
| 15 | SNE2123 | GND SCREW | (E, EG |
| 16 | XTBS3+8JFZ1 | SCREW | |
| 17 | XTB3+16JFZ | SCREW | |
| 19 | RGL0241-Q | PANEL LIGHT | |
| 20 | RGL0242-Q | PANEL LIGHT | |
| 21 | RFKNTCH510EA | BUTTON, SET | (E, GC |
| 21 | RFKNTCH510EC | BUTTON, SET | (EG) |
| 22 | RGU1091-K | BUTTON, SELECTOR | |
| 23 | RGU1092-K | BUTTON, EQ/TIMER | |
| 24 | RFKNTCH510EE | BUTTON, V. BASS | |
| 25 | RHE5079YA | SCREW | |
| 26 | RMB0370-L | SPRING | |
| 27 | RFKNTCH510EB | BUTTON BAND | (E, GC |
| 27 | RFKNTCH510ED | BUTTON BAND | (EG) |

## ■ Cabinet Parts Location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